A HAND-BOOK

TO THE

FLORA OF CEYLON.

A HAND-BOOK

TO THE

FLORA OF CEYLON

CONTAINING

DESCRIPTIONS OF ALL THE SPECIES OF FLOWERING PLANTS INDIGENOUS TO THE ISLAND,

AND

NOTES ON THEIR HISTORY, DISTRIBUTION, AND USES.

BY

HENRY TRIMEN, M.B. (LOND.), F.R.S.,

DIRECTOR OF THE ROYAL BOTANIC GARDENS, CEYLON.

With an Atlas of Plates

ILLUSTRATING SOME OF THE MORE INTERESTING SPECIES.

Part III.

VALERIANACEÆ—BALANOPHORACEÆ.

WITH PLATES LI—LXXV.

LIBRARY
NEW YORK
BOTANICAL
GARDEN

PUBLISHED UNDER THE AUTHORITY OF THE GOVERNMENT OF CEYLON.

LONDON:
DULAU & CO., 37 SOHO SQUARE, W.
1895.

QK350
.T75
pt. 3

LONDON
PRINTED BY STRANGEWAYS AND SONS,
Tower Street, Cambridge Circus, W.C.

NEW YORK
BOTANICAL
GARDEN

LXVIII.—VALERIANACEÆ.

PERENNIAL herbs; l. opp., without stip., pinnate; fl. small, regular, bisexual, in cymes; cal.-tube adnate to ov., segm. 10, scarcely visible in fl., but becoming long and filiform in fr.; cor. funnel-shaped, lobes 5, imbricate; stam. 3, inserted on base of cor.-tube, anth. distinct; ov. inferior, 3-celled, but only one cell fertile, with a single pendulous ovule; fruit dry, indehiscent, crowned by the pappus-like cal.; seed solitary, without endosperm.

A small Family of temperate regions; our only species is montane.

VALERIANA, *L.*

For characters, see Order.—Sp. 150; 3 in *Fl. B. Ind.*

V. Moonii, *Arn. ex Clarke, in Fl. B. Ind.* iii. 213 (1881).
V. villosa, Moon Cat. 5 (non Thunb.). *V. Hardwickii*, Thw. Enum. 159 (non Wall.). C. P. 150.
Fl. B. Ind. iii. 213.

A perennial herb with a horizontal rootstock, giving off numerous long roots; stem 2–4 ft., erect, stout, furrowed, glabrous or slightly hairy, hollow; radical and lower cauline l. pinnate, on long erect stout petioles dilated at base and furrowed above, upper cauline ones on very short petioles, lflts. 3–7, opp. or alt., sessile, ovate, tapering to base which is often unequal-sided, acute, more or less deeply and coarsely dentate-serrate, glabrous or hairy on veins beneath, flaccid, the terminal the largest; fl. numerous, small, sessile, cymes large, terminal, paniculate-corymbose, repeatedly dichotomous, close in fl., becoming lax in fruit, bracts linear or oblong, opposite, persistent; cor.-lobes oblong, obtuse; stam. much exserted; fruit very small, $\frac{1}{8}$ in., crowned with 10 long slender plumose cal.-segm., oval-oblong, much compressed, plano-convex, with 3 filiform ribs on convex (dorsal) and 1 on flat (ventral) surface, quite glabrous, margins sharp.

Upper montane zone; common. Adam's Peak (Moon). Fl. Feb.–April; pale pinkish-violet.
Endemic.
This is almost certainly a variety with smooth fruit of the Himalayan *V. Hardwickii*, Wall.; and *V. Hookeriana*, W. and A., of the Nilgiri Mts., figured in Wight, Ill. t. 129, appears to be another form. Dries a

MAY 1 1900

coppery-brown. The root has the strong characteristic scent of Valerian, and could, doubtless, be employed as an efficient substitute for that of *V. officinalis.*

LXIX.—DIPSACACEÆ.

PERENNIAL herbs, l. opp., without stip.; fl. regular, bisexual, small, in dense heads, each bracteate and with a cal.-like involucel surrounding the ov. and becoming adnate to it in fruit; cal.-tube adnate to ov., limb cup-shaped, segm. 4; cor.-tube funnel-shaped, lobes 4; stam. 4, inserted on cor.-tube, anth. distinct; ov. inferior, 1-celled, with one pendulous ovule; fruit dry, indehiscent (an achene), included in the involucel; seed solitary with scanty endosperm.

A small Order confined to temperate parts of Europe, Asia, and Africa; our single species is in the hills.

DIPSACUS, *L.*

For characters, see Order.—Sp. 12; 6 in *Fl. B. Ind.*

D. Walkeri, *Arn. Pug.* 26 (1834).

Thw. Enum. 421. *D. Leschenaultii*, Thw. Enum. 160 (? Coult.). C. P. 2404.

Fl. B. Ind. iii. 218. Wight, Ic. t. 1166.

A stout perennial herb, stem 2–5 ft., erect, stiff, branched above, furrowed, glabrous below, more or less hairy above, usually with short scattered yellow prickles at the angles, hollow; radical and lower cauline l. large, deeply pinnatisect, on long more or less hairy petioles dilated at base, segm. oblong or oblong-oval, obtuse or acute, decurrent, more or less coarsely and bluntly serrate, hairy on both sides, upper cauline ones sessile, often nearly entire; fl. very numerous, closely packed, sessile, head 1–1½ in. diam., nearly globose, on very long peduncles, with small ovate acute pubescent bracts at base, floral bracts oblong, with a terminal, stiff, very acute and sharp-pointed appendage which is pubescent and usually strongly ciliate, floral involucel with 4 lanceolate segm.; cal.-segm. obtuse, ciliate with long white hairs, usually deciduous in fruit; cor.-tube hairy without and within, lobes oblong, obtuse; stam. exserted; fruit (with adherent involucel) oblong-linear, 4-angled, glabrous.

Open places and roadsides in upper montane zone; rather rare. About Nuwara Eliya abundant. Fl. April, May; white, anth. and bracts dark purple.

Endemic.

Very close to *D. Leschenaultii*, Coult. of the Nilgiris (Wight, Ill. t. 130), and scarcely differing in the form of the bracts. I consider that Thwaites was probably right in uniting them.

LXX.—COMPOSITÆ.

HERBS or shrubs (very rarely trees), l. alt. (rarely opp.), without stip.; fl. very small, regular or irregular, bi- or unisexual, sessile, with or without bractlets, closely packed on the dilated summit of the peduncle (*receptacle*) to form a *head* which is enclosed in or surrounded by an *involucre* of bracts; cal.-tube adnate to ov., limb usually of hairs (*pappus*), or of a few bristles or scales or quite absent; cor. (absent in fem. fl. of *Xanthium*) either tubular, with 5 valvate lobes, or *ligulate*, *i.e.*, split down one side and everted with the lobes more or less completely connate (when all the fl. in a head are tubular it is said to be *discoid*, when the outer ones or all are ligulate it is *rayed*); stam. 5, inserted in cor.-tube, fil. free, anth. connate into a tube (except in *Xanthium*); ov. 1-celled, crowned with an epigynous disk, with a solitary erect ovule, style bifid; fruit an achene, crowned by the pappus; embryo straight, no endosperm.

This immense and well-defined Order contains about ten per cent. of all known flowering plants. It is especially characteristic of dry and warm temperate countries, and is less represented in moist Tropical regions than in any other parts of the world. In Ceylon the proportion is reduced to less than three and a half per cent., and the Order, instead of standing at the head of the list for numbers, comes eighth. We have but 78 species, and the majority of those found in the low country are common weeds (many, doubtless, introduced); were it not for the great abundance of some of these, the Family would indeed be inconspicuous here. In the montane region, however, it is different; here occur 52 species, and of these 34 are restricted to it, including 6 species of *Vernonia*, 8 of *Anaphalis*, 5 of *Senecio*, 2 of *Gynura*, and 4 of *Blumea*, and single species of *Myriactis*, *Lagenophora*, *Helichrysum*, *Chrysogonum*, *Laggera*, *Centipeda*, *Emilia*, *Notonia*, and *Crepis*. In the dry region are 33 species, of which 9 are restricted to it: *Grangea*, *Erigeron*, *Blumea* (2 species), *Blepharispermum*, *Glossogyne*, *Laggera aurita*,

Sphæranthus amaranthoides, and *Notonia grandiflora*. Only 2 are confined to the moist low country, *Conyza* and *Blumea angustifolia*. There are in all 18 endemic species; 14 in the Hills only, 1 in the moist low country, and 3 in both, but none in the dry region.

Heads discoid (not rayed), fl. all tubular (see also 25).
 Fl. all bisexual.
  Style-arms subulate; fl. violet (*Vernonieæ*).
   Heads usually many-flowered . . . . 1. VERNONIA.
   Heads about 4-flowered . . . . . 2. ELEPHANTOPUS.
  Style-arms clavate; fl. purplish (*Eupatorieæ*) . . . . 3. ADENOSTEMMA.
  Style-arms long, tapering, hairy; fl. yellow 30. GYNURA.
  Style-arms truncate, tipped with conical tuft of hair.
   Fl. violet . . . . 31. EMILIA.
   Fl. pale yellow . . . . . . 32. NOTONIA.
 Outer or lower row or rows of fl. female.
  Anth.-cells not tailed or sagittate at base.
   Pappus of long hairs . . . . . 10. CONYZA.
   Pappus none or a few bristles or a ring.
    Receptacle convex or elongated.
     Pappus of 2 or 3 bristles . . . . 4. DICHROCEPHALA.
     Pappus a short ciliate tube . . . 5. GRANGEA.
     Pappus none . . . . . . 28. CENTIPEDA.
    Receptacle flat, small . . . . 29. ARTEMISIA.
  Anth.-cells tailed or sagittate at base.
   Pappus of hairs.
    Inv.-bracts without appendages.
     Anth.-cells tailed . . . . . 11. BLUMEA.
     Anth.-cells sagittate . . . . . 12. LAGGERA.
    Inv.-bracts scarious, with appendages.
     Receptacle smooth . . . . . 16. ANAPHALIS.
     Receptacle bristly . . . . . 17. HELICHRYSUM.
   Pappus none, or of 2 or 3 bristles.
    Heads few, distinct . . . . . 13. EPALTES.
    Heads numerous, combined into compound heads.
     Herbs . . . . 14. SPHÆRANTHUS.
     Climbing shrub . . . . . 15. BLEPHARISPERMUM.
Heads rayed; disk-fl. tubular, ray-fl. ligulate (often absent in 25).
 Pappus of hairs.
  Style-arms flattened; anth.-cells obtuse.
   Heads small, disk-fl. numerous . . . 8. ERIGERON.
   Heads very small, disk-fl. 1–3 . . . . 9. MICROGLOSSA.
  Style-arms truncate; anth.-cells either tailed or obtuse.
   Inv.-bracts in several rows . . . . 18. VICOA.
   Inv.-bracts in one row . . . . . 33. SENECIO.
 Pappus none, or of scales or bristles.
  Receptacle without bracteoles.
   L. alt., stem leafy . . . . . . 6. MYRIACTIS.
   L. radical, heads on leafless scapes . 7. LAGENOPHORA.

Receptacle with bracteoles (*Helianthoideæ*).
  Pappus none.
    Ray-fl. few (often 0 in 25).
      Inv.-bracts very glandular, outer wide-spreading . . . . . 21. SIGESBECKIA.
      Inv.-bracts not glandular, outer ones leafy . . . . 19. CHRYSOGONUM.
      Inv.-bracts not glandular, outer not leafy . . . . 25. SPILANTHUS.
    Ray-fl. numerous . . . . . . 22. ECLIPTA.
  Pappus of a few scales.
    Ray-fl. small, white . . . . . 23. BLAINVILLEA.
    Ray-fl. large, yellow . . . . . 24. WEDELIA.
  Pappus of a few bristles.
    L. opp.; ray-fl. white . . . . . 26. BIDENS.
    L. radical; ray-fl. yellow . . . . 27. GLOSSOGYNE.
Heads rayed; fl. all ligulate (*Cichoriaceæ*).
  Heads small, in corymbs; achene tapering, smooth . . . . 34. CREPIS.
  Heads small, in clusters; achene shortly beaked, muriculate . . . . . . 35. LACTUCA.
  Heads large, solitary; achene truncate, smooth 36. LAUNÆA.
Heads unisexual, fem. fl. apetalous . . . . 20. XANTHIUM.

1. **VERNONIA,*** *Schreb.*

Herbs or shrubs, rarely trees, l. simple, alt.; heads large or small in terminal cymes or rarely solitary, involucre cup-shaped or oblong, bracts in several rows, innermost longest, receptacle usually pitted; fl. usually numerous, all tubular and bisexual; cor.-lobes deep, narrow; anth.-cells obtuse or acute, not tailed at base; style-arms subulate; achene usually striate or ribbed, pappus of many hairs, usually with the outer row much shorter, sometimes of scales.—Sp. 380; 45 in *Fl. B. Ind.*

Herbs or undershrubs.
  Pappus pale red or coppery.
    Achenes terete or 4- or 5-ribbed.
      Bracts acute or mucronate.
        L. thin, linear or linear-lanceolate . 1. V. GARDNERI.
        L. coriaceous, oval . . . . . 2. V. THWAITESII.
      Bracts obtuse, rounded . . . . 12. V. PECTINIFORMIS.
    Achenes 10-ribbed.
      Semi-shrubby; heads clustered . . 7. V. SCARIOSA.
      Annual, heads solitary, large . . . 8. V. ANTHELMINTICA.
  Pappus yellowish- or brownish-white.
    Heads moderate-sized or large.
      L. glabrous or nearly so.
        Involucre cup-shaped . . . . 3. V. ANCEPS.
        Involucre oblong . . . . . 9. V. NEMORALIS.
      L. densely felted beneath . . . 10. V. WIGHTIANA.

---

* After William Vernon, who collected in India at end of seventeenth century.

Heads small or very small.
L. tapering to base.
Bracts linear, mucronate; annual . 4. V. CINEREA.
Bracts with a long soft arm; perennial 5. V. SETIGERA.
Bracts oblong, obtuse . . . . . 6. V. HOOKERIANA.
L. auriculate at base . . . . . 11. V. ZEYLANICA.
Tree . . . . 13. V. ARBOREA.

1. **V. Gardneri,** *Thw. Enum.* 161 (1860), (excl. var. β).
C. P. 27, 1745.
Fl. B. Ind. iii. 230.

Perennial herb, stem branched, finely pubescent, or nearly glabrous, l. rather crowded, 2–5 in., from lanceolate to linear, tapering to both ends, very acute, sharply spinous-serrate, glabrous, veins conspicuous beneath, petiole obscure; heads few, long-stalked, large, slightly nodding, inv.-bracts linear-lanceolate, acuminate, very acute, glabrous, somewhat spreading, the outermost much shorter; achene cylindrical, pubescent, pappus pale red.

Moist region from 2000 to 6000 ft.; rather common. Peradeniya; Deltota; Ambagamuwa; Ramboda; Adam's Peak. Fl. Jan., Feb.; pale violet.
Endemic.
The leaves vary greatly in width.

2. **V. Thwaitesii,** *Clarke, Comp. Ind.* 11 (1876).
V. Gardneri, var. *nervosa*, Thw. Enum. 161. C. P. 44.
Fl. B. Ind. iii. 231.

Perennial herb, with a small woody rootstock, stem 9–18 in., erect, stiff, pubescent, slightly branched, l. crowded on lower part of stem, erect, 1–2 in., oval, acute at both ends, sharply serrate, glabrous or slightly pubescent beneath, coriaceous, reticulate venation very prominent, petiole very short; heads smaller than in *V. Gardneri*, on very long peduncles, few, erect, inv.-bracts oblong, suddenly mucronate, with narrow membranous margins, slightly hairy, the outer ones short, spreading, linear; achene 10-ribbed, with glands between the ribs, pappus pale red, outer row very short.

Upper montane zone; very rare. Adam's Peak (Gardner); on wet rocks below Horton Plains towards Galagama, abundant. Fl. Feb.–May; bright violet.
Endemic.

3. **V. anceps,** *Clarke ex Hk. f. Fl. B. Ind.* iii. 233.
V. Wightiana, var. β, Thw. Enum. 160. C. P. 164.
Fl. B. Ind. iii. 233.

Shrubby, stems slender, slightly branched, hairy when young; l. 1½–3 in., linear or lanceolate-linear, much tapering

to base, acute, denticulate-serrate, glabrous or very slightly hairy, petiole obscure; heads moderate-sized, on long woolly-pubescent peduncles, in corymbs, involucre shallow, bracts somewhat spreading and squarrose, narrowly oblong, ovate, woolly-pubescent; achene 4- or 5-ribbed, glabrous, glandular, pappus brownish-white, outer row of very short scales.

Montane zone; rare. Adam's Peak (Gardner); Ambagamuwa (Thwaites). Fl. March; bright light violet.

Endemic.

4. **V. cinerea,** *Less. in Linnæa,* iv. 291 (1829). **Monara-kudimbiya,** *S.* **Chitiviyarchenkalainir,** *T.*

Herm. Mus. 2, 31. Burm. Thes. 211. Fl. Zeyl. n. 419. *Conyza cinerea,* L., Moon Cat. 58. Thw. Enum. 160. C. P. 1736.

Fl. B. Ind. iii. 233. Burm. Thes. t. 96, f. 1.

Annual, stem $\frac{1}{2}$–2 ft., erect, stiff, cylindrical, striate, more or less pubescent, slightly branched; l. distant, the lowest 2 in. but gradually smaller upwards, broadly oval to linear-lanceolate, tapering to base, subobtuse, apiculate, coarsely and shallowly crenate-serrate, more or less hairy on both sides, petiole $\frac{1}{4}$–$\frac{3}{4}$ in.; heads small, on long stalks, in lax divaricate terminal corymbs, inv.-bracts linear, mucronate, silky, fl. 20–25; achene not ribbed, hairy, pappus white, outer row very short.

A very common weed, abundant everywhere. Fl. all the year; bright pinkish-violet.

Throughout the Tropics of the Old World.

From its growth in all kinds of situations, this puts on very varying appearances, but there are no marked separable varieties. *V. albicans,* DC., recorded for Ceylon by Clarke (Comp. Ind. 22), is referred to in Fl. B. Ind., and specimens densely covered with grey tomentum are not uncommon.

5. **V. setigera,** Arn. Pug. 27 (1836).

V. neilgherryensis, Thw. Enum. 160 (non DC.). C. P. 20.

Fl. B. Ind. iii. 235.

An undershrub with numerous erect much-branched stems, 3–4 ft. high, terete, striate, coarsely hairy; l. $1\frac{1}{2}$–3 in., ovate or ovate-lanceolate, tapering to base, acuminate, shallowly but sharply crenate-serrate, roughly hairy on both sides, petiole $\frac{1}{4}$ in., hispid; heads small, very numerous, shortly stalked, crowded in paniculate cymes, inv.-bracts few, lax, linear, thin and chaffy, with a soft long awn at apex, ciliate, sparingly hairy, fl. few (about 10), scarcely exceeding bracts; achenes 4–5-ribbed, densely glandular, pappus pale yellowish-white, outer row extremely short, spreading.

Upper montane zone; rather common. Adam's Peak; Nuwara Eliya, &c., abundant. Fl. Feb., March; pale violet.

Endemic.

6. **V. Hookeriana,** *Arn. Pug.* 28 (1836).
V. conyzoides, Thw. Enum. 160 (non DC.) C. P. 1737.
Fl. B. Ind. iii. 235.

Perennial (or annual?), stem erect, 2–4 ft., slightly branched, cylindrical, striate, hoary with adpressed hair; l. $1\frac{1}{2}$–$3\frac{1}{2}$ in., ovate or ovate-lanceolate, suddenly tapering to base, acuminate, very acute, sharply serrate, finely pubescent above, tomentose, pale and with prominent venation beneath, petiole $\frac{1}{2}$ in.; heads very small, on long slender stalks, cymes large, lax, paniculate-corymbose, inv.-bracts oblong, obtuse, minutely apiculate, silky-pubescent, fl. much exserted; cor.-lobes very long; achenes slightly 4-angled, very slightly adpressed, hairy, pappus yellowish-white, outer row minute, forming a narrow ring on summit of achene.

Moist region, 1000–6000 ft.; common. Fl. Jan.–March; bright violet. Endemic.

7. **V. scariosa,** *Arn. Pug.* 28 (1836).
Decaneurum (?) *scariosum*, DC. Prod. vii. 264. *Centratherum scariosum*, Clarke, Comp. Ind. 4. Thw. Enum. 161. C. P. 389.
Fl. B. Ind. iii. 236.

A semi-shrubby perennial, stems more or less covered with coarse shaggy hair or sometimes nearly glabrous; l. $1\frac{1}{2}$–4 in., oval, tapering to both ends, very acute, coarsely serrate, the teeth often with filiform points, rough with minute prickly hairs on both sides, often also with long shaggy hair beneath, petiole $\frac{1}{4}$ in., hairy; heads moderate-sized, sessile, crowded in small terminal clusters, involucre narrow, oblong, bracts in many rows, lanceolate-oblong (outer ones shorter) with a spreading mucronate point, slightly pilose, fl. few (about 10), slightly exceeding inv.; achene strongly 10-ribbed, glabrous, pappus short, not twice as long as achene, quickly deciduous, pale orange-brown, outer row nearly half as long as rest.

Var. β, **crassa,** *Thw. Enum. l. c.* C. P. 2825.

L. larger, 5–7 in.; inv.-bracts ovate, villous, with the terminal mucro very long and filiform.

Montane zone, 4000–7000 in shady places; rather rare. N. Eliya; Kotmalie; Hunasgiriya; var. β below Horton Plains. Fl. Feb.–April; violet.
Endemic.
This, by its 10-ribbed fruit, short deciduous pappus, and different inflorescence, connects *Vernonia* with *Centratherum*, of which 7 species occur in Peninsular India.

8. ***V. anthelmintica,** *Willd. Sp. Pl.* iii. 1634 (1800). **Sanni-nayan,** *S.* **Kadduchchirakam,** *T.*
Herm. Mus. 66. Burm. Thes. 210. Fl. Zeyl. n. 418. Moon Cat. 57. Thw. Enum. 160. C. P. 487.
Fl. B. Ind. iii. 236. Burm. Thes. t. 95.

A stout annual, stem about 2 ft., much branched above, cylindrical, striate, finely glandular-pubescent; l. 4–5 in., oval or lanceolate, very much tapering to base, acute, coarsely and sharply serrate, sparsely glandular-pilose on both sides, thin; heads large, solitary, on rather long peduncles thickened upwards, inv.-bracts oblong-linear, acute, the outer pilose, as long as the inner, filiform, spreading, all ultimately reflexed after fruiting, receptacle nodular, fl. numerous; cor.-tube very long and slender; achene 10-ribbed, slightly hairy, black, pappus short, not twice as long as achene, pale red, sub-deciduous, the outer row very short, scale-like, persistent.

Waste ground about houses and by roadsides; common, especially in the dry region, but nowhere indigenous. Fl. Dec.–Feb.; pale violet.

Also in India and the Malay Peninsula.

This is much grown and used as a vermifuge medicine, and has thus become naturalised. Hermann mentions this use.

9. **V. nemoralis,** *Thw. Enum.* 161 (1860).
Clarke, Comp. Ind. 11. C. P. 216.
Fl. B. Ind. iii. 237.

Tall herbaceous perennial, stem slender, slightly branched, nearly glabrous; l. 3–4 in., narrowly ovate-lanceolate, acute at base, much acuminate, acute, coarsely and sharply serrate, glabrous, pale and minutely punctate beneath, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; heads rather large, on long peduncles, involucre oblong, bracts much imbricate, finely floccose, the inner ones oblong, obtuse, apiculate, the outer ones short, acute, receptacle deeply pitted, fl. numerous; achene faintly ribbed, with silky hairs, pappus yellowish-white, outer row very short.

In shady places by streams in the moist region at 1000–4000 ft.; rather rare. Singhe-raja Forest; below Horton Plains; Morowak Korale. Fl. Feb.–May; dark violet.

Endemic.

The plant from Morowak Korale has linear l., and narrower more acute bracts to the involucre.

10. **V. Wightiana,** *Arn. Pug.* 27 (1836).
Thw. Enum. 160 (excl. var. β). Clarke, Comp. Ind. 19. C. P. 1741.
Fl. B. Ind. iii. 238.

A low undershrub, usually about 2–3 ft., branches stout, cylindrical, densely clothed with fine orange or whitish velvety tomentum; l. variable, 2–4 in., oval-oblong, usually acute at

base, subacute or obtuse or rounded and often apiculate at apex, nearly entire or crenate or denticulate, cottony or (when mature) nearly glabrous above, densely felted beneath with buff or white or greyish-orange tomentum, venation reticulate, prominent, petiole $\frac{1}{2}$–$\frac{5}{8}$ in., tomentose; heads moderate-sized, $\frac{3}{4}$ in. diam., involucre cup-shaped, bracts oblong, shortly mucronate, tomentose, outermost short, narrower, fl. numerous, spreading; achene compressed 3-angled, glabrous, glandular, pappus yellowish-white, outer row very short.

Patanas from 4000 ft. upwards; common. Fl. all the year; bright pale violet.

Endemic.

A beautiful plant; shows considerable variability in the size and shape of the leaves and their covering, and in the size of the heads. Sometimes grows into a large bush, 8 ft. high.

11. **V. zeylanica,** *Less. in Linnæa*, 344 (1829). **Pupula,** *S.* **Kuppilay,** *T.*

Herm. Mus. 5, 35. Burm. Thes. 52. Fl. Zeyl. n. 306. *Eupatorium zeylanicum*, L. Sp. Pl. 837; Moon Cat. 57. Thw. Enum. 160. Clarke, Comp. Ind. 20. C. P. 1738.

Fl. B. Ind. iii. 238. Burm. Thes. t. 21.

An undershrub with many straggling divaricate cylindrical branches, finely white-tomentose when young; l. 1$\frac{1}{2}$–3 in., fiddle-shaped, auriculate at base, obtuse or subacute at apex, strongly crenate and undulate, glabrous above, white with fine wool beneath, rather thick and stiff, venation reticulate, pellucid, prominent beneath, petiole short, tomentose; heads small, numerous, very shortly stalked, often in threes, cymes large, lax, irregular corymbose, inv.-bracts oblong-oval, apiculate, closely imbricate, slightly floccose-pubescent, fl. few (6–8), wide-spreading, the cor. being curved outwards, the pappus hairs erect altogether in centre of head; cor.-lobes linear, acute spreading at tips; achene faintly 5-ribbed, pubescent, pappus yellowish-white, the outer row scanty, extremely short.

Low country in both moist and dry regions; very common. Fl. Sept., Oct.; very pale violet.

Endemic.

Used as an external application to wounds.

12. **V. pectiniformis,** *DC. in Wight, Contrib.* 6 (1834).

Arn. Pug. 27. *V. puncticulata*, DC. Prod. vii. 264. Clarke, Comp. Ind. 15. Thw. Enum. 161. C. P. 294.

Fl. B. Ind. iii. 239. Wight, Ic. t. 1077.

A shrub, branches stout, furrowed, younger ones usually clothed with short floccose wool and marked with prominent

leaf-scars; l. numerous, closely placed, often overlapping, $1\frac{1}{2}$–4 in., oval, acute or tapering to base, acute at apex, closely pectinate-serrate at margin, which is usually closely reflexed, so that the l. looks entire from above, glabrous or more or less floccose on both sides, veins prominent beneath, petiole short, obscure; heads rather large, numerous, stalked, in dense corymbose cymes, involucre shallow, bracts few, oval-oblong, rounded, glabrous, fl. about 12; achene faintly ribbed, glabrous, pappus coppery-red, sub-deciduous, outer row $\frac{1}{3}$ length of rest.

Upper montane zone; rather rare. Nuwara Eliya; Adam's Peak; Pedurutalagala; Ambagamuwa. Fl. March, April; violet.

Also in the Nilgiris.

A very distinct species.

13. **V. arborea,** *Ham. in Trans. Linn. Soc.* xiv. 218 (1824). **Kobomella,** *S.*

V. javanica, DC., Thw. Enum. 160. Clarke, Comp. Ind. 23. C. P. 1742.

Fl. B. Ind. iii. 239.

A moderate-sized tree, twigs densely covered with fine white or yellowish wool, l. 4–6 in., lanceolate or oblong-lanceolate, acute or rounded at base, acuminate, acute, entire, glabrous above, finely but densely felted beneath with grey or yellowish tomentum, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; heads rather small, very shortly stalked, numerous, in large paniculate cymes, involucre cup-shaped, bracts few, oval or oblong-oval, obtuse, densely woolly, fl. few (6–12), much exserted but not spreading; achene compressed, 3- or 4-angled, glabrous, pale yellow, pappus yellowish-white, all the rows equal in length.

Moist region up to 5000 ft.; rather common. Fl. Aug., September; pale violet or white.

Also in India and Malaya.

If *V. javanica* be kept separate from *V. arborea*, our plant belongs to the former, but they are combined in Fl. B. Ind. The tree of the Nilgiris is there distinguished as var. *Wightiana;* it is *Monosis Wightiana*, DC., and *Vernonia Monosis*, Clarke, and is figured in Wight, Ic. t. 1085 (Spic. Neilgh. t. 105) and Bedd. Fl. Sylv. t. 226.

This is the only Composita in Ceylon that attains the dimensions of a tree. Wood soft, of no value.

2. ELEPHANTOPUS,* *L.*

Perennial herb, l. mostly radical, simple, heads small, very numerous, closely packed in flat-topped compound heads

---

* Linnæus thus translated the Tamil name (as given in Rheede); the Sinhalese has the same meaning, Elephant's footprint.

supported on three large bracts, inv.-bracts few in two rows, fl. few (usually 4) in a head, tubular, bisexual; cor. deeply 5-lobed; anth. cells obtuse at base; style-arms short, subulate; achene very small, compressed, finely 10-ribbed, pappus of few hairs dilated at base.—Sp. about 12; 1 in *Fl. B. Ind.*

E. scaber, *L. Sp. Pl.* 814 (1753). **Ét-adi,** *S.* **Anichovadi,** *T.*
Moon Cat. 59. Thw. Enum. 161. C. P. 1772.
Fl. B. Ind. iii. 242. Wight, Ic. t. 1086 (not good).

Biennial or perennial, with a short vertical rootstock giving off many stout fibrous roots; l. mostly radical, forming a spreading rosette on the ground, 4–5 in., oblong-lanceolate, attenuate to base, acute at apex, undulate, shallowly crenate-serrate, rough with coarse hairs on both sides, ciliate on margin, veins very prominent beneath, petiole short, very broad, sheathing; flowering stem 6–18 in., stout, rigid, tough, scabrous with minute prickles and with adpressed white hair, dichotomously branched above, with a small amplexicaul acute leaf at each bifurcation, heads very numerous, sessile, closely packed, forming a large flat-topped terminal inflor. nearly 1 in. wide, and surrounded at base with 3 large, stiff, broadly ovate, conduplicate, leafy bracts, inv.-bracts 8, in two rows, linear, acuminate, the outer ones half as long as the inner and scarious, fl. exserted; cor.-tube long, very slender, lobes widely spreading; style very much exserted, tapering, pubescent, arms recurved; achene truncate, nearly glabrous.

Open ground up to 7000 ft.; very common. Fl. Feb., March; bright pale violet.

Throughout Tropical Asia, Australia, and America.

One of the commonest weeds in turf, and, owing to its long roots, difficult to eradicate. The leaves are used as an external application. Dwarf specimens from Horton Plains have but one head of inflorescence on a short simple scape $1\frac{1}{2}$–3 in. high.

3. ADENOSTEMMA, *Forst.*

Annual, l. opp., simple; heads moderate-sized, few, on long peduncles, inv.-bracts numerous, equal, in two rows, connate at base, receptacle flat, very slightly pitted, fl. numerous, bisexual, all tubular; anth. obtuse at both ends; style-arms very large and long, clavate; achene compressed, truncate, pappus of 5 (or less) spreading, clavate, viscous-glandular processes.—Sp. 5 or 6; 1 in *Fl. B. Ind.*

A. viscosum, *Forst. Nov. Gen.* 45 (1776).

Burm. Thes. 95. Fl. Zeyl. n. 310. *Verbesina Lavenia*, L. Sp. Pl. 902. *Lavenia erecta*, Willd., Moon Cat. 57. *A. angustifolium*, Arn. Pug. 29. Thw. Enum. 162. C. P. 594.

Fl. B. Ind. iii. 242. Burm. Thes. t. 42. Wight, Ic. t. 1087 (*A. latifolium*).

A large annual herb, stem 1–3 ft., stout, glabrous below, very glandular-pubescent above, purple, branched in upper part; l. rather large, 3–6 in., broadly ovate, usually suddenly narrowed into a long tapering base, acute, coarsely dentate-serrate, glabrous or pubescent, 3-nerved at base, petiole obscure; heads somewhat drooping in very lax cymes, involucre hemispherical, bracts linear-strap-shaped, obtuse, slightly ciliate; cor.-tube short, very glandular-hairy and viscous outside, lobes very small; style-arms twice as long as cor., and very much exserted; achene oblong, compressed, 4- or 5-ribbed, viscid, with numerous stalked glands, blackish-brown, crowned with a narrow ring, from which the pappus processes or glands are projected.

Var. β, **reticulatum,** *Clarke, l. c.* 29. *A. reticulatum*, DC., Wight, Ic. t. 1088.

L. thicker, with prominent reticulate venation, pubescent beneath; inv.-bracts viscous-pubescent; achene quite glabrous.

Shady places, throughout the island; very common; var. β the commoner form. Fl. all the year; purplish, the styles white.

In all Tropical countries.

Like other common Compositæ, this presents much variation in the form of the leaves, but the numerous species proposed are not worth distinction even as varieties. I have never seen Arnott's *A. angustifolium*, described as having linear-lanceolate leaves. The achenes adhere to surrounding objects by the very viscid stalked glands (pappus).

Ageratum conyzoides, L., is the most abundant and troublesome annual weed in the island, occurring literally everywhere, but especially in cultivated land. It is the 'White-weed' or 'Goat-weed' of planters, *Pumpullu* of the Tamil coolies, and *Hulan-tala* of the Sinhalese. It is probably of S. American or W. Indian origin, but may have spread throughout the Tropics by natural causes. There is a figure in Hook. Exotic Flora, t. 15 (1823), where it is remarked that the plant is 'well deserving of a place in every stove.' It is in Moon's Cat. p. 57.

4. DICHROCEPHALA,* *DC.*

Annual, l. alt., pinnatifid; heads small, globose; inv.-bracts few, in one row, very small, lanceolate, receptacle

---

* From the heads bearing yellow fl. above and white ones beneath.

depressed-globose, smooth, fl. minute, numerous, all tubular, the lower fem., in several rows, cylindrical, 2- or 3-toothed, the upper bisexual, few, funnel-shaped, 5-lobed, anth.-bases truncate, style-branches of bisexual fl. short, flattened; achene compressed, smooth, pappus of fem. fl. 0, of bisexual fl. of 2 or 3 bristles.—Sp. 5; 4 in *Fl. B. Ind.*

D. latifolia, *DC. in Wight, Contrib.* 11 (1834).
Cotula bicolor, W., Moon Cat. 58. Thw. Enum. 162. C. P. 1766, 3303.
Fl. B. Ind. iii. 245 (not given for Ceylon). Wight, Ic. t. 1096.

Annual, 6–24 in. high, stem usually divaricately branched, cylindrical, with white spreading hair, l. oval, usually deeply pinnatifid, with a large ovate terminal lobe and one or two pairs of much smaller lateral ones, all coarsely crenate-serrate, sparsely hairy on both sides, veins prominent beneath; heads about $\frac{1}{6}$ in., few, depressed-globose, on rather long divaricate peduncles, inv.-bracts inconspicuous, with scarious lacerate margins; fem. fl. very minute, white, style-arms exserted, bisexual fl. larger, cor. lobes short, acute.

Damp waste ground; a common weed at all elevations. Fl. all the year; fem. fl. white, bisexual greenish-yellow.

Throughout the Tropics of the Old World.

Very variable; C. P. 1766 is an erect unbranched form with undivided leaves, and small, more numerous heads.

5. GRANGEA, *Adans.*

Annual, with prostrate stems, l. alt., pinnatifid; heads moderate-sized, in pairs, involucre cup-shaped, bracts in 2 rows, equal, receptacle convex, fl. numerous, minute, densely crowded, all tubular, the outer fem., the rest bisexual; anth.-bases obtuse; style-arms of bisexual fl. short, truncate; achene terete, glandular, pappus a short tube with fimbriate mouth.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

G. maderaspatana, *Poiret, Encycl. Méth. Suppl.* ii. 825 (1811).
Artemisia maderaspatana, L., Moon Cat. 58. Thw. Enum. 163. C. P. 1767.
Fl. B. Ind. iii. 247. Wight, Ic. t. 1097.

Annual, stems numerous, spreading from centre, prostrate, 6–12 in., hairy, branched, buds white-woolly; l. numerous, $1\frac{1}{2}$–$2\frac{1}{2}$ in., sessile, deeply pinnatifid with 2–4 pair of opp. lobes smaller towards the base, terminal part larger, all coarsely serrate-dentate, pubescent; heads $\frac{3}{8}$–$\frac{1}{2}$ in., depressed-globose,

on short ped., usually in pairs on leaf-opposed peduncle, inv.-bracts oval, obtuse, thick and rigid, pubescent; cor.-tube campanulate above, persistent, lobes acute.

Open ground in dry region, especially on the bunds and margins of tanks; rather rare. Batticaloa; Kantalai; Habarane; Anuradhapura. Fl. all the year; yellow.

Throughout Tropical Asia and Africa.

6. **MYRIACTIS,** *Less.*

Annual, l. alt.; heads small, involucre cup-shaped, bracts few, in one row, receptacle flat, naked, ray-fl. numerous, in 2 rows, ligulate, fem., disk-fl. numerous, tubular, bisexual; anth.-bases obtuse; style-arms of bisexual fl. flattened, acute, achene compressed, margined, pappus 0.—Sp. 5; 3 in *Fl. B. Ind.*

M. Wightii, *DC. in Wight, Contrib.* 10 (1834).
Thw. Enum. 162. C. P. 1740.
Fl. B. Ind. iii. 247. Wight, Ic. t. 1091.

Annual, stem erect, 1–2½ ft., stiff, more or less rough with hairs, branches few, erect; l. sessile, 1½–3 in., obovate-oblong, coarsely serrate or incised, the lower ones with the upper half ovate and deeply lobed at base and the lower half narrow, the uppermost small, entire, all rounded and rather amplexicaul at base, acute at apex, hairy on both sides; heads small, terminating long branches, inv.-bracts oblong, obtuse, with scarious margins, pubescent; ray-fl. very small, cor. spreading, tube very glandular, limb linear, shortly 2-toothed, cor. of disk-fl. deeply lobed, tube short, glandular; achene bluntly beaked, quite glabrous.

Grassy places in upper montane zone; common. Fl. all the year; ray white or purple, disk yellow.

Also in the Nilgiri Mountains.

7. **LAGENOPHORA,** *Cass.*

Perennial herb, l. radical, heads small, solitary, terminal; involucre campanulate, bracts few, linear, receptacle small, convex, glabrous, ray-fl. in 1–3 rows, ligulate, female, disk-fl. few, tubular, bisexual (usually sterile); anth.-bases obtuse, style-arms of bisexual fl. flattened; achene oval-oblong, compressed, beaked, pappus 0.—Sp. about 12; 1 in *Fl. B. Ind.*

L. Billardieri, *Cass. in Dict. Sc. Nat.* xxv. 111 (1820?). [PLATE LV.]
L. Harveyi, Thw. Enum. 162. C. P. 21.
Fl. B. Ind. iii. 248.

A small perennial herb, with a short erect rootstock and very long thick roots; l. all radical forming a rosette, sessile, $\frac{3}{4}$–2 in., oblong-spathulate, tapering to base, obtuse or rounded at apex, shallowly crenate-serrate, slightly hairy on both sides, rather thick, whitish beneath; head solitary, terminating erect slender glabrous scapes from the l.-axils 2–6 in. high, involucre $\frac{1}{6}$ in., bracts narrowly linear with hyaline margins, glabrous, erect, ultimately spreading, acute, ray-fl. spreading, cor.-short, not toothed, disk-fl. glandular outside; achene quite without ribs, very smooth, beak truncate.

On the patanas, montane zone, 4000–7000 ft.; rather common. Fl. April and Oct., Nov.; ray white or purplish, disk green.

Also in Khasia, Malay Islands, China, and Australia, but not in Peninsular India.

The nearest approach to the daisy (*Bellis perennis*) in Ceylon, but with very much smaller flower-heads.

8. ERIGERON, *L.*

Annual, l. alt., heads corymbose; involucre cup-shaped, bracts numerous, narrowly linear, ultimately reflexed, receptacle flatly depressed-globose, muriculate, ray-fl. in many rows, outermost very narrowly ligulate, female, disk-fl. numerous, tubular, bisexual; anth.-bases obtuse, style-arms of bisexual fl. flattened, achene very small, much compressed, pappus of many long hairs.—Sp. 100; 7 in *Fl. B. Ind.*

E. asteroides, *Roxb. Fl. Ind.* iii. 432 (1832). **Narakaramba,** *T.*
Conyza ægyptiaca, Thw. Enum. 163 (non DC.). C. P. 1733.
Fl. B. Ind. iii. 254 (not given for Ceylon).

Annual, 1–2 ft., stem much branched, very hairy with spreading hair; l. sessile, 1–2 in., oblong or obovate-oblong, auriculate and half-amplexicaul, obtuse, coarsely and irregularly incise- or dentate-serrate, hairy on both sides; heads $\frac{3}{8}$ in. wide, few, on long peduncles, inv.-bracts very narrow, attenuate, puberulous, slightly viscous, with membranous margins; ray-fl. very narrowly filiform, exceeding the bracts, acute; achene oval-oblong, glabrous, pale-brown, pappus pinkish-white.

Low country, especially in sandy places in dry region and on sea-shore; rather common. Anuradhapura; Mineri; Trincomalie; Colombo; Galle. Fl. Sept.-Dec.; ray pinkish-violet, disk yellowish.

Also in India.

Strongly and pleasantly scented. Only the outermost row of fem. fl. has a ligulate cor., that of the inner ones is shorter than the pappus, and tubular with a truncate mouth.

E. linifolius, Willd., a native of western temperate Asia, has become an exceedingly abundant weed in the montane zone, and has recently spread into the low country. It apparently originated in Hakgala Botanic Garden, having been introduced with seeds from St. Petersburg about 1864. It is C. P. 3928.

9. **MICROGLOSSA,** *DC.*

Shrub, l. alt.; heads very small, numerous, in corymbose cymes, involucre narrow, bracts few, outer ones short, ray-fl. 6–8, ligulate, female, disk-fl. 1–3, tubular, bisexual; anth.-bases obtuse; style-arms of bisexual fl. flattened, achene ribbed, pappus copious, hairs unequal.—Sp. 6; 3 in *Fl. B. Ind.*

M. zeylanica, *Clarke*, *Comp. Ind.* 58 (1876).
Solidago zeylanicus, Arn. Pug. 29. *Amphirhaphis zeylanica*, DC., Thw. Enum. 162. C. P. 162.
Fl. B. Ind. iii. 257.

A very much-branched bush, 2–4 ft. high, branches erect, young ones striate, finely woolly-pubescent; l. numerous, about 4 in. linear-lanceolate, much tapering to both ends, acute, faintly denticulate-serrate, finely puberulous above and on the prominent veins beneath, smaller venation reticulate, very fine, pellucid, petiole $\frac{1}{2}$ in.; heads about $\frac{1}{6}$ in. pedicellate, cymes stalked, terminal and from upper l.-axils, forming a large flat-topped inflor., inv.-bracts narrowly lanceolate, acute, pubescent, ray-fl. spreading, tongue-like, acute, without terminal teeth, disk fl. campanulate above, lobes short, acute; achene hairy.

Moist region in open places up to 6000 ft.; very common. Fl. Sept.–Dec.; pale sulphur-yellow.

Also in Travancore.

An abundant shrub in all waste stony ground, especially on the lower patanas at 2–3000 ft.

10. **CONYZA,** *Less.*

Perennial, l. alt.; heads small, numerous, involucre campanulate, bracts in 2 rows, linear, lax, receptacle convex, glabrous, fl. minute, numerous, all tubular, outer fem., remainder usually bisexual; anth.-bases obtuse; style-arms flattened; achene very small, compressed, pappus copious, in one row, reddish.—Sp. 50; 8 in *Fl. B. Ind.*

C. viscidula, *Wall. Cat.* n. 3006 (1828).
Thw. Enum. 163. C. P. 1739.
Fl. B. Ind. iii. 258.

A perennial herb, stem 1–3 ft., stout, erect, striate, glandular-pubescent, much branched above; l. sessile, 3–6 in., much tapering to base and apex, acute, distantly and shallowly serrate, very finely pubescent on both sides, venation reticulate, fine, pellucid; heads shortly stalked, crowded in stalked clusters to form a long paniculate inflor., inv.-bracts linear, acuminate, very acute, pubescent, with narrow, membranous margins; achene glabrous, pappus pale coppery-pink.

Open places, 1000–3000 ft.; rather rare. Passara; Badulla; Hantane. Fl. Oct.–April; yellowish.

Also in India, Burma, Java, Australia, New Caledonia, and the Philippines.

11. BLUMEA, *DC.*

Annual or perennial herbs, l. alt., heads small, usually numerous, involucre ovoid or campanulate, bracts in several rows, narrowly linear, receptacle flat, glabrous, fl. all tubular, several rows of outer ones female, disk-fl. few, bisexual, anth.-bases sagittate and with slender tails; style-arms flattened or not; achene small, oblong or linear, compressed or not, often ribbed, pappus in one row, white or reddish.—Sp. about 60; 36 in *Fl. B. Ind.*

Sp. 3 to 7 are closely allied, and there are many intermediate forms which it is difficult to refer definitely to any of them.

Heads solitary.
  L. dentate . . . . 1. B. AMPLECTENS.
  L. serrate . . . . 2. B. BIFOLIATA.
Heads more or less clustered.
  Hairy, silky, or densely pubescent, often also glandular.
    Heads small (under $\frac{1}{4}$ in.)
      Achenes not ribbed; l. similarly pubescent on both sides . . . . . . 3. B. LACERA.
      Achenes ribbed; l. hairy above, very white-silky beneath . . . . . . 4. B. BARBATA.
    Heads larger (over $\frac{1}{4}$ in.).
      L. narrowly lanceolate, dentate, woolly or silky . . . . 5. B. FLEXUOSA.
      L. oval, denticulate, with long yellow hair . 6. B. CRINITA.
      L. oblong-lanceolate, deeply gashed, scabrous above. . . . . . . 7. B. HIERACIIFOLIA.
  Nearly or quite glabrous, or simply glandular.
    Very glandular . . . . . 8. B. MEMBRANACEA.
    Not glandular.
      Heads numerous in large lax panicle. . 9. B. SPECTABILIS.
      Heads very few in small cyme . . 10. B. ANGUSTIFOLIA.

1. **B. amplectens,** *DC. in Wight, Contrib.* 13 (1834).
Thw. Enum. 163. C. P. 1730.
Fl. B. Ind. iii. 260.

Annual, stem about 1 ft. high, often much branched from base, hairy; l. rather small, 1–2 in., sessile, oval-oblong, acute or subacute, auriculate at base, dentate, with regular triangular teeth, the upper ones smaller, often entire, slightly hairy on both sides; heads rather small, solitary, few, terminal, on rather long peduncles, inv.-bracts narrowly linear, densely pubescent, inner row tipped with a long white bristle; outer fl. very slender, filiform; achene very small, oblong, compressed, 3-ribbed, pappus pink.

Var. β, **arenaria,** *Hk. f.* *B. arenaria*, DC., Thw. Enum. 163. C. P. 1732.

L. slightly toothed or nearly entire, usually very hairy or silky.

Sandy ground, especially near the shore in the dry region; common. Fl. Feb., March; yellow.

Also in India.

Very difficult to distinguish when dry from *Erigeron asteroides*, but easily known when living by the absence of the violet ray-fl.

2. **B. bifoliata,** *DC. in Wight, Contrib.* 14.
Clarke, Comp. Ind. 72. 'C. P. 3523.'
Fl. B. Ind. iii. 261.

Very like *B. amplectens*, from which it differs in being semi-shrubby at base, with l. broader, more acute, sparingly serrate (not dentate), very villous or silky, the upper ones opp.; pappus white.

Dry region, apparently rare. Round the salt-pans at Kirinde, S. Prov.; near Mihintale, NC. Prov. Fl. Aug., Dec.; yellowish.

Also in India, Burma, Malay Peninsula.

Thwaites did not distinguish this from *B. amplectens*, and C. P. 3523 quoted for it in Fl. B. Ind. does not exist in Herb. Perad.

[*B. Wightiana*, DC., is given for Ceylon in Fl. B. Ind. iii. 261—no doubt on the faith of Arn. Pug. 29, where a var. *villosior* is recorded from the Island. Clarke (Comp. Ind. 74) says he has seen no specimen; and *B. lacera*, to which it is very close, has probably been mistaken for it. *B. Leschenaultiana*, DC., however, which is regarded as a synonym, is also given in DC. Prod. v. 435 as from Ceylon.]

3. **B. lacera,** *DC. Prod.* v. 436 (1836).
Thw. Enum. 163. Clarke, Comp. Ind. 76. C. P. 1735.
Fl. B. Ind. iii. 263.

Annual, stem 1–2 ft., erect, branched above, usually densely glandular-pubescent; l. oval or oblong-oval, sessile, tapering to base, obtuse or subacute, sharply dentate-serrate, finely silky-pubescent on both sides; heads not exceeding

$\frac{1}{4}$ in., numerous, on glandular-pubescent stalks, rather crowded in short cymes forming a large elongated infl., inv. narrowly linear, acuminate, glandular-hairy; achene not ribbed, pappus white.

A common weed by roadsides, borders of paddy fields, &c.; up to about 4000 ft. Fl. September, &c.; fl. purple.

Throughout Tropical Asia and Africa.

Clarke (l. c.) refers C. P. 560 and 1734 to this as varieties. I think they are better placed under *B. membranacea* as in Fl. B. Ind. Scent sweetly aromatic.

4. **B. barbata,** *DC. in Wight, Contrib.* 14 (1834).
Thw. Enum. 163. Clarke, Comp. Ind. 73. C. P. 1731.
Fl. B. Ind. iii. 262.

Annual, stem 1–1$\frac{1}{2}$ ft., erect, stiff, nearly simple, slender, sparsely clothed with long white hair; l. small, 1–2 in., sessile, oval or obovate-oblong, tapering to base, acute, spinous-serrate, coarsely hairy above, very white and silky with adpressed hair beneath; heads about $\frac{1}{4}$ in., not very numerous, on glandular-hairy stalks in short lax cymes forming an elongated infl.; inv.-bracts as in *B. lacera*, sparsely glandular-hairy, fl. rather few; achene linear, not compressed, ribbed, pappus white.

Lower montane zone; rather rare. Pusselawe; Dolosbagie. Fl. December, Jan.; yellow.

Also in Travancore.

Distinguished by its small slender habit, and the l. very silky and white beneath.

5. **B. flexuosa,** *Clarke, Comp. Ind.* 86 (1876).
B. hieraciifolia, var. *β*, Thw. Enum. 163. C. P. 19 and 403 in part.
Fl. B. Ind. iii. 267.

Stem 2–4 ft. or more, very erect, almost unbranched, stout, densely covered with silky or cottony spreading hair, l. rather numerous, 1$\frac{1}{2}$–3$\frac{1}{2}$ in. (smaller upwards), oblong-oval to linear-lanceolate, sessile, tapering to base, subacute or obtuse at apex, sharply denticulate or serrate sometimes almost spiny on margin, more or less cottony-silky above when young but becoming glabrous and harsh when old, usually white beneath with long silky hairs sometimes cottony-pubescent; heads about $\frac{3}{8}$ in. on stalks nearly the same length, ovate-oblong, cymes dense, elongated, paniculate, inv.-bracts numerous, densely clothed with long silky hair; fl. numerous; achene linear, ribbed, glabrous.

Upper montane zone; common. Adam's Peak; Nuwara Eliya, &c., abundant. Fl. Oct., &c.; purple or pale yellow, scales purplish.

Also in the Nilgiris.

A puzzling plant, very variable in size, and connecting *B. barbata*, from which it chiefly differs in its larger size, with *B. hieraciifolia*, with which Thwaites combined it. The name *flexuosa* is very inappropriate to this stiff erect plant. The Fl. B. Ind. is incorrect in describing the inv.-bracts as broad.

Has a faintly aromatic scent.

6. **B. crinita,** *Arn. Pug.* 30 (1836).
Thw. Enum. 163. Clarke, Comp. Ind. 84. C. P. 147.
Fl. B. Ind. iii. 267.

Perennial, with a short horizontal rootstock, stem $1\frac{1}{2}$–3 ft., nearly simple, stout, more or less covered with yellow hair; l. sessile (the lowest sometimes shortly stalked), broadly oval or oblong-oval, obtuse and semi-amplexicaul at base, sub-acute, denticulate, scabrous, and nearly glabrous above when mature, more or less covered with long yellow hair beneath, stiff; heads rather large, $\frac{3}{8}$–$\frac{1}{2}$ in., sessile or stalked, in small stalked clusters forming a sparse elongated inflor., inv.-bracts, acute, numerous, extremely woolly, with long, copious, silky, yellow hair, fl. numerous; achene strongly ribbed, glabrous, pappus white.

Upper montane zone in wet, swampy places; rare. Adam's Peak (Gardner); about Nuwara Eliya in several places. Fl. Nov.; yellow.

Endemic.

Leaves dry black.

7. **B. hieraciifolia,** *DC. in Wight, Contrib.* 15 (1834?).
Thw. Enum. 163 (excl. var. β). C. P. 19 and 403 (in part).
Fl. B. Ind. iii. 263 (not given for Ceylon).

Perennial (?), stems 2–5 ft., very erect, stout, nearly glabrous, or more or less scabrous, with short hairs, slightly branched; l. 3–6 in., smaller upwards, the lowest shortly stalked, the rest sessile, oblong-lanceolate, much tapering to base, acute, irregularly gashed or coarsely dentate-serrate, hispid or scabrous above, more or less hairy or scabrous beneath; heads rather large, $\frac{3}{8}$–$\frac{1}{2}$ in., shortly stalked, crowded in small rounded clusters, forming a large elongated inflor. with shaggy-hairy branches; inv.-bracts acute, with purple points, hairy-pubescent; achene oblong, strongly ribbed, glabrous, pappus rather scanty, white.

Upper montane zone; rather rare. Adam's Peak (Gardner); below Horton Plains towards Galagama; Totapella; Hakgala. Fl. Dec.–Feb.; yellow.

Also in India and Java (?).

Known by its large size and harsh usually gashed leaves. I doubt this being *B. hieraciifolia*, DC., to which Thwaites has referred it. It is certainly not Wight, Ic. t. 1099. Dries black.

8. **B. membranacea,** *DC. Prod.* v. 440 (1836).
B. glandulosa, Thw. Enum. 163 (non DC?). C. P. 1734.
Fl. B. Ind. iii. 265.

Annual, stem 2–4 ft. or more, stout, striate, branched above, usually finely glandular-pubescent; l. 3–4 in., numerous, the lower stalked, the upper usually sessile, all obovate-oval, very much tapering to base, obtuse, coarsely dentate or irregularly gashed, glandular-pubescent on both sides, thin, veins prominent beneath; heads ¼ in., on short glandular ped., in small dense clusters, forming an elongated, glandular, interrupted inflor., inv.-bracts with membranous margins, glandular-pubescent, the outer ones much shorter, spreading, achenes ribbed, glabrous, pappus white.

Var. β, **Gardneri,** *Hk. f. in Fl. B. Ind., l. c.* *B. virens,* DC., var. *zeylanica, l. c.* 80, Clarke. C. P. 560, 2822.

Taller, often 5 or 6 ft., slightly pubescent or perfectly glabrous; lower l. often much gashed or even lobed, very membranous; inflor. larger, extremely lax and paniculate, heads on slender, glabrous or slightly glandular, divaricate ped.; outer inv.-bracts numerous, rather squarrose, achene hairy.

A weed in the low country, especially in the dry districts; common; also in the hills to 4000 ft. Fl. all the year; yellowish.

Throughout India and Malaya.

Very variable. Often in the dry country very viscid with glands and strong-smelling. The two species *B. virens* and *B. membranacea* can scarcely be separated; but perhaps our var. β should rather be placed under the former, as is done by Clarke.

9. **B. spectabilis,** *DC. Prod.* v. 445 (1836).
B. myriocephala, Thw. Enum. 163 (non DC.). *B. Wallichii,* Clarke, Comp. Ind. 87. C. P. 1744.
Fl. B. Ind. iii. 269.

Stem tall, 4–6 ft., stout, glabrous or puberulous, scarcely branched; l. large, the lower ones 12–14 in., the upper 6–9 in., sessile, narrowly lanceolate, very much tapering to base, less so to apex, acute, shallowly dentate-serrate, often with 2 or 3 small, narrow, divaricate lobes at the very base, glabrous on both sides, heads about ⅜ in., on rather long pubescent stalks, very numerous, forming a very large, elongated, pyramidal, lax panicle, with a narrow, leafy bract below each branchlet; inv.-bracts numerous, the outer rows short and slightly spreading, all acute, slightly pubescent; achene narrow, faintly ribbed, hairy, pappus pale coppery-red.

Moist region up to 4000 ft.; rare. Near Hakmana, S. Prov.; Hantane. Fl. Feb.; yellow.

Also in S. India.

10. **B. angustifolia,** *Thw. Enum.* 164 (1860). [PLATE LVI.]
Clarke, Comp. Ind. 81. C. P. 691.
Fl. B. Ind. iii. 264.

A small perennial herb with a slender vertical or ascending rootstock, stem 4–10 in., erect, slender, quite glabrous; l. mostly radical $1\frac{1}{2}$–$2\frac{1}{2}$ in., linear, very gradually tapering at base into long petiole, acute, faintly crenate-serrate towards apex, glabrous; heads few, scarcely $\frac{1}{4}$ in., nodding, on slender stalks which are glabrous or slightly cottony, about 3–6 in a small terminal cyme, receptacle muriculate, inv.-bracts acute, puberulous; achene oblong-ovoid, without ribs, slightly hairy, pappus white.

Damp places among rocks, 1000–3000 ft.; apparently very rare. Ambagamuwa (Gardner); Hantane; a mile below Peradeniya by the Mahaweli river. Fl. Jan.–March; yellow.

Endemic.

A small, smooth, slender plant, very unlike the other species.

[*B. balsamifera*, DC. (*Conyza balsamifera*, L.) is recorded for Ceylon by Moon (Cat. 58), whose locality is Kandy, and by Thwaites (Enum. 422), who so named specimens collected at Trincomalie by Glenie in 1862, which are C. P. 3665. (See *Laggera aurita*, Benth.) The true *B. balsamifera* is native to Assam, Burma, and Malaya; it was, however, called '*Conyza arbor Zeylonensis*,' &c., by Plukenet, and on that account got included in Burm. Thes. 74.]

12. LAGGERA, *Schultz-Bip.*

Annual or perennial herbs, scarcely differing from *Blumea* save in the anth.-bases which are sagittate but not tailed, and in having a more branched habit.—Sp. 10; 4 in *Fl. B. Ind.*

Stem 4-winged	1. L. ALATA.
Stem cylindrical	2. L. AURITA.

1. **L. alata,** *Sch.-Bip. ex Oliver Trans. Linn. Soc.* xxix. 94 (1873).
Blumea alata, DC., Thw. Enum. 163. C. P. 551.
Fl. B. Ind. iii. 271. Wight, Ic. t. 1101 (*Blumea*).

A perennial herb, stem 2–4 ft., erect, stout, stiff, widely 4-winged throughout, finely woolly, with numerous short branches; l. $1\frac{1}{2}$–3 in., sessile with the base decurrent to form the wings on the stem, narrowly oblong, obtuse, finely denticulate, roughly pubescent above, cottony-woolly beneath; heads numerous, about $\frac{3}{8}$ in., solitary, nodding or drooping on rather long woolly bracteate stalks, axillary and terminal on the short leafy branches, involucre ovate-ovoid, bracts linear, numerous, acuminate, very acute, the outer ones shorter lax, somewhat spreading or recurved, slightly pubescent or woolly,

achene linear, cylindrical, slightly ribbed, with adpressed hair, pappus white.

Montane zone, 4000–6000 ft.; rather common, especially abundant on the patanas of Uva. Fl. Feb., March; purple.

Also in E. Himalaya, Burma, Nilgiris, Java, China, and Trop. Africa. Whole plant very aromatic when bruised.

2. **L. aurita,** *Benth. ex Clarke, Comp. Ind.* 92 (1876).
Blumea balsamifera, Thw. Enum. 422 (non DC.). C. P. 3665.
Fl. B. Ind. iii. 271 (not given for Ceylon).

A perennial herb, stem erect, rather slender, cylindrical, viscous-hairy, with many ascending branches; l. numerous, sessile, very slightly decurrent, 2–4 in. on the main stem, very much smaller often bract-like on the branches, obovate-oblong, subacute, much and coarsely dentate or semi-pinnatifid, usually auriculate at base, viscous-hairy on both sides; heads small, stalked, erect, in small cymes terminating short lat. branches, inv.-scales linear, very acute, outer silky-hairy, inner longer, scarious; achene linear, pappus white.

Dry region; apparently very rare. I have seen only the C. P. specimens collected by Glenie at Trincomalie in 1862. Fl. March.

Throughout Peninsular India and in Burma, also in Trop. Africa.

Probably elsewhere in the dry sandy regions, but overlooked. It has a strong camphoraceous smell.

13. EPALTES, *Cass.*

Annual, much branched, l. alt., decurrent, heads small, solitary, terminal; involucre shallowly campanulate, bracts in several rows, sharply acuminate, receptacle broad, flat, glabrous, all fl. tubular, outer ones very small, female, disk fl. bisexual; anth.-bases sagittate, shortly tailed; style-branches of bisexual fl. subulate; achene oblong, cylindrical, ribbed, pappus 0.—Sp. 9; 2 in *Fl. B. Ind.*

E. divaricata, *Cass. Bull. Philom.* 139 (1818). **Hin-muda-mahana,** *S.*

Herm. Mus. 26. Burm. Thes. 61. Fl. Zeyl. n. 420 (*Erigeroides*). *Ethulia divaricata*, L., Moon Cat. 57. Thw. Enum. 164. C. P. 234.

Fl. B. Ind. iii. 274. Burm. Fl. Ind. t. 58, f. 1 (poor). Plak. Phyt. t. 160, f. 5.

Annual, 2–12 in. high, main stem usually short, erect, with numerous very long, divaricate, straggling branches, winged, glabrous or very slightly hairy; l. ¾–1½ in., sessile, strap-shaped, tapering to decurrent base, obtuse, sparingly denticulate, glabrous; heads terminating short, winged branchlets, about ⅜ in. diam., depressed globose, inv.-bracts lanceolate,

rigid, sharply acuminate, glabrous, the outer ones somewhat spreading; achene glabrous, quite without pappus.

In damp places chiefly on or near the coast, especially in the dry region; common. Fl. Sept.–March; purple.

Also in India, Burma, Java, China.

Very variable in size and appearance; the leaves become fleshy in maritime situations. Fruit is produced only by the fem. ray-fl., the bisexual disk-fl. are barren. Root bitter and astringent, used as a tonic.

14. **SPHÆRANTHUS,** *L.*

Annuals, divaricately branched, l. alt., decurrent; heads small, very numerous, sessile, crowded on a large, ovoid, common receptacle into more or less globose, terminal, compound heads, with or without a general involucre of empty bracts at base, true involucre narrow, bracts few, lax, in 1 row, acute or acuminate, unequal, chaff-like, all fl. tubular, outer ones female, 3-toothed, disk fl. 1 or very few, bisexual, larger, 5-toothed (often barren); anth.-bases sagittate; style-arms filiform, often connate; achene oblong-ovoid, pappus 0.—Sp. 8; 4 in *Fl. B. Ind.*

Bracts of compound head imbricate, spinous . 1. S. AMARANTHOIDES.
Bracts of compound head neither imbricate nor spinous.
  Wings of stem sharply toothed . . . 2. S. INDICUS.
  Wings of stem entire . . . . . . 3. S. AFRICANUS.

1. **S. amaranthoides,** *Burm. f. Fl. Ind.* 186 (1768). **Chiva-charantai,** *T.*
Thw. Enum. 162. C. P. 1768.
Fl. B. Ind. iii. 274. Wight, Ic. t. 1149 (*Oligolepis*).

Erect, 6–12 in., stem very stout, with many ascending branches, glabrous, purple; l. numerous, 3–3½ in., sessile and slightly decurrent, strap-shaped, somewhat tapering to base, obtuse, faintly serrate, glabrous, pale green; compound heads large, ½–¾ in. long, sessile or shortly stalked, terminal (often apparently axillary), ovate-ovoid, completely covered by the close, imbricate, ovate-lanceolate, rigid, spinous, glabrous bracts, which exceed the fl. heads; outer fl. stalked, disk fl. solitary.

Shallow pools chiefly near the coast in the dry region; rather rare. Jaffna; Illupai-kadavai; Mannar; Kurunegala. Fl. Feb., August; pale purple.

Also in S. India.

The plant has a very strong smell of mint when bruised.

2. **S. indicus,** *L. Sp. Pl.* 927 (1753). **Muda-mahana,** *S.*
Herm. Mus. 18. Burm. Thes. 220. Moon Cat. 59. *S. hirtus*, Willd., Thw. Enum. 162. C. P. 1769.
Fl. B. Ind. iii. 275. Burm. Thes. t. 94, f. 3. Wight, Ic. t. 1094.

About 1 ft. high, with many long, tough, divaricate branches, stem cylindrical, strongly winged with the sharp-toothed decurrent bases of the l., glandular-hairy; l. 1–2 in., sessile, decurrent, oval, slightly tapering to base, obtuse or subacute, sharply spinous-serrate, very glandular and also with long white hair on both sides, glaucous-green; compound heads $\frac{3}{8}$–$\frac{5}{8}$ in., ovoid-globose on winged peduncles, heads very numerous, densely packed, bracts linear, rather shorter than fl. heads, ciliate at the end; achene stalked, smooth.

Wet places, especially paddy fields, in the low country; common. Fl. Aug., September, &c.; purple.
Also in the Tropics of the Old World generally.
'Muda-mahana' may be translated 'bald-pate,' and alludes to the shaven head of the Buddhist monks which the bare receptacle is thought to resemble (compare the names *Senecio* and *Erigeron*). The plant has an aromatic scent when handled, and is used medicinally as a bitter tonic and vermifuge.

3. **S. africanus,** *L. Sp. Pl. ed.* 2, 1314 (1762).
S. microcephalus, Willd., Thw. Enum. 162. C. P. 1770.
Fl. B. Ind. iii. 275.

About 8–18 in. high, stem compressed, glabrous, very strongly winged with nearly entire decurrent bases of the l., branches numerous, divaricate; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., sessile, decurrent, obovate-oval, tapering to base, obtuse, finely and slightly serrate, finely glandular-pubescent on both sides; compound heads small, under $\frac{3}{8}$ in., globose, on short wingless peduncles, often apparently leaf-opposed, heads very small, densely crowded, bracts oblong-obovate, obtuse, glabrous, shorter than fl.-heads.

Wet places in low country; very common. Fl. Dec.–March; purple.
Throughout the Tropics of Asia, Africa, and Australia.

15. **BLEPHARISPERMUM,** *Wight.*

A climbing shrub, l. alt., entire; heads small, numerous, sessile, collected into compound heads which are globose, stalked, terminal and without any general involucre, bracts one to each fl., the outer ones (involucre) oblong, boat-shaped, the inner (bractlets on the receptacle) longer and narrower, fl. few, all tubular, outer (usually 3) female, obscurely toothed, disk-fl. 3 or 4, bisexual (but usually barren), 5-fid; anth.-bases

sagittate, scarcely tailed; style-arms of bisexual fl. short, obtuse; achene triangular-compressed, strongly ciliate on edge, pappus of 2 or 3 strong bristles or none.—Sp. 3; 2 in *Fl. B. Ind.*

B. petiolare, *DC. in Wight, Contrib.* 12 (1834).
Arn. in Mag. Zool. Bot. ii. 421. Trim. in Journ. Bot. xxiii. 171; Syst. Cat. Ceyl. Pl. 47.
Fl. B. Ind. iii. 276 (not given for Ceylon). Wight, Ic. t. 1092.

A straggling shrub climbing by means of its divaricate branches, woody stem attaining nearly 1 in. diam., bark grey, longitudinally furrowed, twigs glabrous; l. 2–4 in., shortly stalked, ovate, rounded or acute at base, tapering to acute apex, entire, margin usually recurved, glabrous above, slightly hairy on veins beneath, thin, bright light green, venation finely reticulate; compound heads about $\frac{5}{8}$ in., stalked, 2–5 in a terminal cyme, stalks 4-angled, glabrous, heads numerous, about 100 in each compound head, about $\frac{1}{4}$ in.; cor. of outer fl. very short, style-arms filiform, exserted, cor. of bisexual fl. with 5 recurved lobes, anth. black; achene shining, dark brown, cilia and pappus-bristles (when present) white.

Dry region, very rare, and confined to the East of the Island. The original specimens were collected, 'Prope Uganda-malej' on '29 Feb., 1796'—Wight says by Klein; but this is apparently an error for Rottler, who travelled down our East coast in that month and year. The place is now called Ukanda. (The specimens, however, are no longer in Rottler's Herb., having been, as in some other cases, probably transferred to Klein's, who was also a member of the Tranquebar Moravian Mission). About Kirinda, Hambantota, and Tissamaharama frequent. Mr. Nevill tells me he has seen it at Mandagala. Fl. December–February; greenish-white.

Also at Courtallum in S. India.

A very remarkable plant; the climbing woody stems are as thick as one's finger.

[*B. subsessile*, DC., is also given for Ceylon in Wight, Contrib. l. c., but Wight's specimens are from Bellary.]

16. **ANAPHALIS,** *DC.*

Perennial herbs often semi-shrubby at base, l. alt., sessile numerous; heads small, numerous; corymbose, involucre campanulate or top-shaped, bracts numerous, in several rows, each with a terminal petaloid appendage, receptacle naked, fl. numerous, all tubular, outer ones narrow, female, disk ones bisexual (often sterile); anth.-bases sagittate, tailed; style-branches of bisexual fl. obtuse or clavate; achene very small,

oblong, cylindrical, pappus of one row of rough hair.—Sp. about 40; 27 in *Fl. B. Ind.*

L. 3–5-veined.
  L. linear or oblong.
    L. acute, cottony . . . . 1. A. CINNAMOMEA.
    L. obtuse, finely tomentose, and with a cottony skin . . . . 2. A. PELLICULATA.
  L. spathulate.
    L. acute; heads small . . . . . 3. A. FRUTICOSA.
    L. obtuse; heads large . . . . . 4. A. THWAITESII.
L. 1- (very rarely 3-) veined.
  L.-margin not recurved . . . . . 5. A. OBLONGA.
  L.-margin recurved.
    L. over 1 in.
      Base of l. broad, rounded . . . . 6. A. ZEYLANICA.
      Base of l. tapering. . . . . . 7. A. MARCESCENS.
    L. under ½ in. . . . . 8. A. BREVIFOLIA.

1. **A. cinnamomea,** *Clarke, Comp. Ind.* 104 (1876).
Gnaphalium adnatum, Thw. Enum. p. 422 (non Wall.). C. P. 568.
Fl. B. Ind. iii. 281.

Stem elongated, often semi-shrubby and woody below and covered with the deflexed persistent withered l., usually much branched, clothed with a thin skin of felted cotton; l. very numerous, spreading, 1½–2 in., linear, acute, often mucronate, margin usually recurved sometimes flat, strongly 3-veined, densely clothed when young on both surfaces with a felt of cottony hair which is persistent beneath, but with age often wears off the upper surface which is then glabrous, shining, and dark green; heads variable, small, in dense rounded clusters which are more or less stalked and form a large flat-topped inflor. often surrounded by l., inv.-bracts erect, appendage ovate-oblong, obtuse or subacute, dead white.

Upper montane zone; common. About Nuwara Eliya frequent; Hakgala; Horton Plains; summit of Rangala Ridge; Wattakelle Hill. Fl. Sept.–Nov.; yellow.

Also in Himalaya, Upper Burma, N. China, and Japan; but apparently not in the Nilgiris.

The leaf-margins are usually recurved, and the tomentum by no means always cinnamon-coloured, but often pure white or greyish. The most variable of our species; there are several forms, and possibly more than one species included. That from the N.E. mountain-mass has broader lanceolate leaves, very ferrugineous beneath, and much larger heads. The foliage is somewhat sweet-scented.

2. **A. pelliculata,** *Trim.* [PLATE LVII.]

Shrubby, stem woody and much branched below, branches very long, divaricate, ascending, stout, covered with a fine tomentum and over that by an easily detached cottony skin;

l. numerous, closely placed, large, $1\frac{1}{2}$–$2\frac{3}{4}$ in., broadly strap-shaped or narrowly oblong, slightly tapering to broad base, obtuse, with a decurved apiculus, margin usually slightly recurved, densely finely tomentose on both sides and covered with a loose removable cottony pellicle, conspicuously 3- or 5-nerved, thick almost fleshy; heads rather small, under $\frac{1}{4}$ in. long and less wide, sessile, congested in a flat-topped or subglobose cottony inflor., involucre cup-shaped, bracts erect or slightly spreading, small, appendage long, oval-oblong, subacute, white.

Upper montane zone; very rare. A few clumps on the slope of Totapella Mt., Horton Plains, at about 7400 ft. Fl. November; yellow, inv.-bracts greenish-white.

Endemic.

The largest of our species, but doubtfully distinct from some forms of *A. cinnamomea.* It differs from *A. adnata* of the Himalaya in its more branched habit, and approaches *A. Beddomii*, Hook., of the Nilgiris, which has still broader 5-veined leaves. Its peculiar indumentum, with the additional removable outer skin formed of the longer hairs matted together, is characteristic, and distinguishes it from the other Ceylon species.

Dr. Stapf informs me that in the Kew Herb. there are specimens of this under C. P. 1763 from N. Eliya, and that it was included as 'form 3' under *A. zeylanica* by Sir J. Hooker; but in Fl. B. Ind. that form is described as having 'very narrow' leaves. From that species it is easily distinguished by the much smaller heads, in addition to the leaf-characters.

3. **A. fruticosa,** *Hk. f. in Fl. B. Ind.* iii. 282 (1881).
Gnaphalium adnatum, var. *spathulifolium*, Thw. Enum. 422 (part).
C. P. 132.
Fl. B. Ind. iii. 282.

Stems rather stout, woody below and covered with persistent imbricated bases of l. above, clothed with white cottony felt; l. very numerous, closely placed, $1\frac{1}{2}$–$1\frac{3}{4}$ in., oblong-spathulate, tapering below to broad sheathing base, acute, glabrous above, covered beneath with a dense soft felt of pale cinnamon-coloured cottony wool, 3-veined; heads about $\frac{1}{4}$ in., shortly stalked, clustered at ends of branches of large lax corymbose panicles, involucre obconic, outer bracts slightly cottony, inner ones longer, pale shining brown, appendage oval, subacute, dead white.

Montane zone; very rare. I have only seen the C. P. specimens which were collected on Adam's Peak by Gardner.

Endemic.

4. **A. Thwaitesii,** *Clarke, Comp. Ind.* 110 (1876).
Gnaphalium adnatum, var. *spathulifolium*, Thw. Enum. 422 (part).
C. P. 528.
Fl. B. Ind. iii. 284.

An undershrub, stem stout, woody, erect, much-branched, branches densely clothed with cottony wool; l. very numerous, crowded and deflexed below, scattered on the flowering branches, rather small, 1–1¼ in., oblong-spathulate, tapering to broad base, obtuse at apex, very densely covered with white cottony wool on both sides, which with age usually peels off the upper surface leaving it glabrous, 3-nerved, very thick; heads large, ⅜ in., nearly sessile, in dense rounded clusters, forming a close compact infl., involucre top-shaped, bracts large, spreading, pale shining brown, slightly cottony, appendage oblong-lanceolate, acute, pale sulphur-yellow.

Upper montane zone; very rare. Horton Plains (Thwaites); Pedurutalagala. Fl. Feb.–April; yellow.

Endemic.

The Fl. B. Ind. quotes also C. P. 2048 for this, which is *Vandellia crustacea* properly. This is our handsomest species; the leaves are distinctly 3-nerved when the cotton is removed (not 'nerveless,' as given in Fl. B. Ind.). Easily known by its large spreading heads.

5. **A. oblonga,** *DC. Prod.* vi. 274 (1837).

Gnaphalium oblongum, Thw. Enum. 422. *G. indicum*, Thw. Enum. 166 (non L.). Clarke, Comp. Ind. 112. C. P. 1762.

Fl. B. Ind. iii. 283.

Stem 1–3 ft., erect, very slightly branched, densely covered with thick cottony felt; l. numerous, crowded below, distant and much smaller above, 1–2 in., oblong, broad and stem-clasping at base, acute, margin flat or very loosely recurved, densely covered on both sides with persistent cottony wool, 1- (rarely 3-) nerved; heads small, ⅙ in., sessile, crowded in globular clusters arranged in a usually close (rarely lax), cottony, corymbose infl., involucre oblong-campanulate, bracts small, not or slightly spreading, narrowly oblong, laxly cottony, appendage acute, bright pink.

Montane zone, 4000–7000 ft.; very common. Especially abundant on the Uva patanas. Fl. April, Sept.–Nov.; dark yellow.

Also in mountains of S. India.

Generally recognisable by the bright pink bracts, which, however, become white in the herbarium; a very variable and abundant species. A plant from Horton Plains has the l. 3- or 5-nerved, and is perhaps var. *elliptica*, Hk. f. (*A. elliptica*, DC.).

6. **A. zeylanica,** *Clarke in Fl. B. Ind.* iii. 286 (1881).

Gnaphalium Wightianum, Thw. Enum. 166 (in part). *Anaphalis Wightiana*, Clarke, Comp. Ind. 111 (non DC.). C. P. 1763.

Fl. B. Ind. iii. 286.

Stems rather slender, 1–2 ft., glabrous below, sparsely cottony above, with few long branches from the base; l. numerous and crowded below, more scattered above, ¾–1 in., oblong, broad and rounded at base, obtuse, apiculate, margin

strongly recurved, loosely cottony on both sides, or nearly or quite glabrous, rather thick and stiff, 1-nerved; heads about $\frac{1}{4}$ in. long, usually considerably broader, nearly sessile, in few rounded clusters rather closely placed and forming a corymbose infl., involucre cup-shaped, cottony at base, bracts spreading, appendage oval, subacute, often erose or toothed, pure white; fl. very numerous.

Upper montane zone on patanas; common. Fl. June–October; bright yellow.

Endemic.

This is very near *Anaphalis Wightiana*, DC. (Wight, Ic. t. 1117), of the Nilgiris. It is a variable plant in foliage; the form with the leaves quite glabrous is common about Hakgala, on Horton Plains, &c., and attains a larger size than that with cottony ones. There is also a form with shorter erect involucre-bracts—perhaps a different species. The Fl. B. Ind. quotes C. P. 568 for this, as well as for *A. cinnamomea*, to which it rightly belongs.

7. **A. marcescens,** *Clarke*, *Comp. Ind.* 110 (1876).
Gnaphalium marcescens, Wight, Thw. Enum. 166. C. P. 1765, 3522.
Fl. B. Ind. iii. 286. Wight, Ic. t. 1115 (*Gnaphalium*).

Semi-shrubby, stems slender, much branched, elongated, clothed when young with a cottony skin; l. numerous, crowded below, $1\frac{1}{4}$–$1\frac{1}{2}$ in., linear or narrowly lanceolate-linear, much tapering below, acute, apiculate, or with a recurved mucro, margin strongly recurved, glabrous and dark green above, densely white-cottony beneath, 1-nerved; heads under $\frac{1}{4}$ in. long and less wide, nearly sessile, numerous, crowded in globose clusters, forming a close rounded infl., involucre oblong or top-shaped, very cottony at base, bracts narrow, not spreading, appendage narrowly oblong-lanceolate, acuminate, acute or obtuse, snow-white.

Var. β, **sulphurea,** *Trim.*

L. broader, spathulate, cottony on both sides till old, when the upper surface becomes glabrous, pale sulphur-yellow beneath; heads more congested.

Upper montane zone in rocky places to highest elevations; rather common. Var. β, Horton Plains. Fl. Oct.–Feb., April; dull yellow.

Also in Nilgiri Mountains, S. India.

This often much resembles *A. cinnamomea.* C. P. 3522 connects the type with var. β.

8. **A. brevifolia,** *DC. Prod.* vi. 273 (1837).
Gnaphalium brevifolium, Thw. Enum. 166. C. P. 1761.
Fl. B. Ind. iii. 286.

Very much branched below, 6–18 in. high, branches slender, divaricate, ascending, clothed with a thin cottony pellicle,

young parts extremely cottony; l. very numerous, small, $\frac{1}{4}$–$\frac{1}{2}$ in., closely placed, imbricate, spreading or deflexed and concealing the stem, oblong-lanceolate, acute, margin recurved, densely cottony on both sides, 1-nerved; heads $\frac{1}{4}$ in. long, over $\frac{3}{8}$ in. broad, slightly cottony at base, sessile or shortly stalked, in small clusters, closely placed and forming a rather dense rounded or flat-topped infl., bracts spreading, appendage large lanceolate, subacute, white.

Upper montane zone in patanas; very common. Fl. Sept.–Nov.; yellow.

Also in Anamalai Hills, S. India.

This is very near *A. nielgherriana*, DC. (Wight, Ic. t. 478). It is easily distinguished from all our other species by its slender, much-branched habit, and small, very numerous imbricated leaves; it is not at all variable.

Gnaphalium multicaule, Willd. (*G. indicum*, Auct. plur. non L.), has recently become a common weed on estates in the hill districts, having apparently been introduced about 1880. Thwaites says in 1864 (Enum. 422) that he has never seen it here. The planters call it 'Wild mignonette.' [*G. indicum* of Linnæus is quite a different plant. It is Fl. Zeyl. n. 307, but Hermann's specimens were erroneously referred to Ceylon. They were collected at the Cape, and are *Amphidoxa gnaphalodes*, DC. (see Journ. Linn. Soc. xxiv. 148).]

17. **HELICHRYSUM,** *Gaertn.*

Perennial, semi-shrubby, l. alt., sessile, numerous; heads small, very numerous, in a large corymbose infl., involucre campanulate, bracts in several rows, loose, scarious, the inner with broad obtuse appendages, receptacle small, flat, pitted and minutely bristly, fl. few, small, all tubular, outer row female, disk ones larger, bisexual; anth.-bases sagittate, tailed; style-arms of bisexual fl. truncate; achene small, pappus long. —Sp. 260 (mostly S. African and Australian); 2 in *Fl. B. Ind.*

This with the species of *Anaphalis* form the 'Everlastings' of our Hills.

H. buddleoides, *DC. in Wight, Contrib.* 20 (1834).
H. Hookerianum, W. and A. in DC. Prod. vi. 201; Clarke, Comp. Ind. 116. *Gnaphalium Hookerianum*, Thw. Enum. 166. C. P. 681.
Fl. B. Ind. iii. 290. Wight, Ic. t. 1113.

Semi-shrubby, stems 2–5 ft. long, stout, cylindrical, densely covered with a thick felt of white (rarely cinnamomeous) cottony wool, slightly branched; l. very numerous, crowded, the lower ones deflexed and concealing the stem, $1\frac{3}{4}$–$2\frac{3}{4}$ in., linear-oblong, broad and stem-clasping at base, tapering to

apex, subacute, margins often reflexed, glabrous and bright green above, very densely covered with pure white (rarely cinnamomeous) cotton beneath, 3–5-veined; heads shortly stalked, flat-topped, densely crowded in numerous, large, globose, peduncled fascicles which are combined to form a large, corymbose, very cottony, terminal infl., bracts and appendages very scarious and transparent, slightly exceeding fl., very obtuse and rounded, cottony outside, the outer ones broader and shorter; achene hispid, pappus rough.

Upper montane zone, on steep banks; rather common. Fl. Nov.–Feb.; bright yellow.

Also in the Nilgiris.

Grows in drooping or pendulous masses. There are no sufficient characters to separate the Ceylon plant (*H. Hookerianum*) from the Indian type, which is, however, usually a larger plant than ours.

H. bracteatum, Willd., a commonly cultivated Australian species in gardens in the Hills, is often found about N. Eliya, &c., in a semi-wild state.

18. **VICOA,** *Cass.*

Annual, l. alt.; heads moderate-sized, terminal or axillary, involucre cup-shaped, bracts in many rows, very narrow, receptacle flat, naked, ray-fl. in one row, closely placed, ligulate, fem., disk-fl. numerous, small, tubular, bisexual; anth.-bases sagittate, tailed; style-arms of bisexual fl. short, truncate, flattened; achene ovoid, not ribbed, hairs of pappus rather scanty.—Sp. 6; 3 in *Fl. B. Ind.*

V. auriculata, *Cass. in Ann. Sci. Nat.* xvii. 33 (1829). **Ranhiriya,** *S.*

Burm. Thes. 124. *Inula indica*, L., Moon Cat. 58. *V. indica*, DC., Thw. Enum. 164. C. P. 1757.

Fl. B. Ind. iii. 297. Burm. Thes. t. 55, f. 2. Wight, Ic. t. 1148.

Annual, stem erect, 1–2 ft., slender, stiff, slightly hairy, with many long ascending branches in upper part; l. numerous, sessile, 1–3 in., narrowly oblong, dilated at base and forming rounded auricles, tapering to apex, serrate, rough with short adpressed hair on both sides, pale beneath; heads solitary, on long, terminal or axillary peduncles, about ¾ in. wide, inv.-bracts linear-setaceous, very acute, with membranous margins, glabrous or very slightly hairy, outer ones shorter, ray-fl. 16–24, cor. long, narrow, 3-toothed, spreading; achene sparsely hairy.

Sandy ground and roadsides up to 4000 ft., but especially in the dry low country; common. Fl. all the year; bright golden yellow.

Also throughout the Indian Peninsula.

The neat symmetrical heads are much copied in native gold work.

Lagascea mollis, Cav., a native of Central America, occurs as a weed about Kandy and other places, having probably originated from the Botanic Gardens, where it is very abundant.

Carpesium cernuum, L. In many places on Horton Plains in 1890. I suspect this to be merely an introduction, as it is a conspicuous plant, but has never been previously recorded from our hills. The fruits may easily have been imported with railway material for the line then in course of construction across Horton Plains to Haputale. It, however, appears to pass muster as a native in the Nilgiris, and is figured (as *C. nepalense*) in Wight, Ic. t. 1120. It has a very wide distribution over the temperate portions of Asia.

19. **CHRYSOGONUM**, *L.*

Perennial herb, l. opp.; heads solitary, axillary or apparently terminal, inv.-bracts few, outer ones leafy, receptacle flat, ray-fl. few (usually 6), ligulate, female, disk-fl. numerous, tubular, bisexual (but barren), each with a paleaceous bract at the base; anth.-bases obtuse; style of ray-fl. short, recurved, tapering, 2-branched, of disk-fl. undivided, pubescent below; achene oblong-ovoid, compressed, edge acute, pappus 0.—Sp. 6; 2 in *Fl. B. Ind.*

C. heterophyllum, *Clarke, Comp. Ind.* 132 (1876).
Moonia heterophylla*, Arn. Pug. 31. Thw. Enum. 134. C. P. 34, 1758.
Fl. B. Ind. iii. 303.

Perennial, sometimes semi-woody at base, very much branched, stems cylindrical, glabrous or slightly hairy especially at the thickened nodes, usually purple; l. opp., 1–3½ in., very variable, sometimes ovate-oval and deeply crenate-serrate but usually triangular in outline, very deeply pinnatisect with 2 pair of opp. segm. and a terminal one, acute, deeply serrate, nearly glabrous, thin, petiole long, dilated and stem-clasping, with narrow leafy border, channelled above, sometimes slightly hairy; heads ½ in., peduncles long, solitary, involucre cup-shaped, bracts in 2 rows of usually 6 in each, outer row leafy, spreading, oblong, inner erect, ovate, papery, ray-fl. 6, each against a bract, cor. flat, as broad as long, deeply 3-lobed; achene glabrous, with a somewhat truncate often tubercular crown, brown.

In damp shady places in the upper montane zone; very common. Fl. all the year; bright golden yellow; anth. black.
Also in mountains of S. India.

---

* Commemorates Alexander Moon, Superintendent of the Ceylon Botanic Gardens from 1816 till his death in 1825, and author of 'Catalogue of Plants of Ceylon,' published in 1824.

Very variable in shape of the leaves, but the larger-flowered *C. Arnottianum* Wight, (Ic. t. 1105) of the Nilgiris has not occurred in Ceylon.

20. **XANTHIUM,** *L.*

Annual, l. alt.; heads of 2 sorts, rather small, axillary, upper ones globose, with numerous bisexual (but sterile) tubular fl. each enclosed by a bracteole, on an ovoid receptacle and with a few small hairy inv.-bracts, lower ones broadly ovoid, with only 2 female (fertile) *apetalous* fl. in an involucre of fused bracts forming an ovoid, closed, spiny, 2-horned, 2-celled utricle (with one fl. in each cell), enlarging with fruit; anth. *distinct*, fil. monadelphous; style of bisexual fl. not divided, of fem. fl. deeply divided, long, exserted from horns of involucre; achenes completely enclosed in cells of enlarged involucre (like seeds in a capsule), much compressed, pappus 0.—Sp. 4; 1 in *Fl. B. Ind.*

Very unlike all the other genera in arrangement of flowers.

X. Strumarium, *L. Sp. Pl.* 987 (1753).
Herm. Mus. 59. Burm. Thes. 233. Fl. Zeyl. n. 564. *X. orientale,* L. Sp. Pl. ed. 2, 1400. Moon Cat. 63. Thw. Enum. 164. C. P. 1771. Fl. B. Ind. iii. 303. Wight, Ic. t. 1104.

Annual, stem short, stout, slightly branched, flexuose, harsh with bristly hairs; l. numerous, 2–3 in. long and almost as broad, on petioles about as long or longer, broadly triangular-ovate, often 3-lobed, somewhat cordate at base, acute, irregularly incised-serrate, harsh with short adpressed hair on both sides; barren heads rather numerous, crowded at top of stem, fertile ones fewer, axillary, involucre of fertile heads in fruit about $\frac{5}{8}$ in., ovoid, capped with 2 erect mucronate beaks, pubescent, thickly set with sharp rather long prickles usually hooked at the ends, hard and tough, 2-celled, achene rather large, $\frac{1}{2}$ in., oblong-ovoid, compressed, glabrous.

Waste ground, margins of tanks, &c., especially in the dry region; rather rare. Kandy (Moon); Passara, Uva; Kantalai; Mihintale; Batticaloa. Probably introduced from India.

Throughout Tropical and warm temperate regions.

Herm. gives the S. name 'Urukossa' for this.

21. **SIGESBECKIA,** *L.**

Annual, l. opp., heads small, terminal, inv.-bracts few

* Commemorates J. G. Siegesbeck, Prof. of Botany at St Petersburg in 1737.

(usually 10), viscous, the 5 outer ones long leafy horizontally spreading, 5 inner wrapped round ray-fl., receptacle small, fl. few, ray-fl. (usually 5) ligulate, female, disk-fl. (usually about 9) tubular, bisexual, each enclosed in boat-shaped membranous bractlet; anth.-bases obtuse, entire; style-arms of bisexual fl. short, acute, flattened; achene not compressed, cuneate, often curved, truncate, pappus 0.—Sp. 2, 1 in *Fl. B. Ind.*

S. orientalis, *L. Sp. Pl.* 900 (1753).
Moon Cat. 58. Thw. Enum. 164. C. P. 1752.
Fl. B. Ind. iii. 304. Wight, Ic. t. 1103.

A large annual herb, 2–4 ft., stem stiff, erect, with opp. horizontal branches below and dichotomously branched above, finely pubescent, purple; l. opp., 2–4 in., oval-triangular, on short petioles, shortly tapering at base, acuminate, acute, deeply and irregularly laciniate-serrate, densely and finely pubescent on both sides, pale yellowish-green, the uppermost much smaller and nearly entire; heads small, pedunculate, subglobose, solitary in the forks of the very large lax dichotomous-corymbose infl., inv.-bracts very dissimilar, five outer over $\frac{1}{2}$ in., linear-spathulate or club-shaped at end, horizontally spreading, with recurved margins, upper surface set with numerous large extremely viscous glandular hairs, five inner short, boat-shaped, obtuse, similarly glandular on back, ray-fl. very short, recurved, 3-toothed; achenes each enclosed in a boat-shaped bractlet, glabrous, slightly rough, black.

In waste places by roadsides, &c.; common at all elevations. Fl. Oct., Nov., &c.; yellow, the ray-fl. red beneath.

In all warm countries.

This has the look of an introduced weed. All the bracts are persistent in the fruit, and each achene when it falls is closely enwrapped in one which is more or less glandular on the back and top. There are no glandular hairs on any other part of the plant than the bracts.

22. ECLIPTA, *L.*

Annual, l. opp.; heads small axillary, involucre cup-shaped, bracts few leafy, receptacle flat with filiform persistent bractlets to the fl., fl. numerous, ray-fl. in 2 rows, ligulate, female (often barren), disk-fl. tubular, bisexual; anth.-bases obtuse, style-arms short, slightly flattened; achenes oblong, compressed, 4-angled, truncate, pappus 0.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

E. alba, *Hassk. Plant. Jav. Rar.* 528 (1848). **Kikirindi,** *S.* **Karippan,** *T.*

E. prostrata, L., Moon Cat. 58. *E. erecta*, L., Thw. Enum. 164. C. P. 1754.

Fl. B. Ind. iii. 304. Lam. Ill. Gen. t. 687 (*E. erecta*). Rumph. Herb. Amboin. vi. t. 18.

Annual, stem erect or prostrate, often rooting at nodes, with many diffuse reddish branches, strigose with adpressed hair; l. sessile, $1\frac{1}{2}$–$2\frac{1}{2}$ in., lanceolate-oblong, tapering to base, acute or subacute, faintly serrate, strigose with scanty adpressed hair on both sides; heads solitary or two together, on stiff unequal peduncles, very flat, inv.-bracts about 8, ovate-lanceolate, acute, herbaceous, ray-fl. spreading, scarcely as long as bracts, linear, not toothed, disk-fl. often with 4-lobed cor.; achene with 2 winged and 2 blunt angles, sides covered with warty excrescences, no pappus but top sometimes with a minute spine.

Wet places throughout the island; very common. Fl. April, Nov., &c.; white.

In all warm countries.

The Ceylon form is usually erect (*E. erecta*, L.), but the prostrate state (*E. prostata*, L.) is common on the coast and elsewhere; they do not otherwise differ. Employed as an alterative medicine by the natives.

23. BLAINVILLEA, *Cass.*

Annual, l. alt. or sub-opp.; heads small, in dichotomous cymes, involucre ovoid, bracts large, broad, concave, passing into the bractlets on the small concave receptacle, fl. few, very small, ray-fl. in one row ligulate, female, disk-fl. bisexual, tubular; anth.-bases obtuse, style-arms flattened, acute; achenes enfolded by the bractlets, oblong, compressed, truncate, crowned by a few unequal acute scales.—Sp. 16; 1 in *Fl. B. Ind.*

B. latifolia, *DC. in Wight, Contrib.* 17 (1834).

Verbesina dichotoma, Willd., Moon Cat. 58. Thw. Enum. 164. C. P. 1753.

Fl. B. Ind. iii. 305. Pluk. Amalth. t. 282, f. 6.

Annual, erect, 1–2 ft., rigid, much branched, branches ascending, scabrous; l. ovate or ovate-lanceolate, 2–3 in., acute at base, tapering to acute apex, shallowly crenate, somewhat 3-nerved at base, harshly hairy on both sides, petiole $\frac{1}{2}$ in., hispid; heads very shortly stalked, in erect, dichotomous, terminal cymes, inv.-bracts subacute, much imbricate, pubescent, bractlets on receptacle as long as fl.,

membranous, rigid, pectinate at truncate apex, pubescent, persistent after fall of the fruit; ray-fl. very short and inconspicuous, not spreading, bifid; achene hispid, dark brown.

A weed by roadsides and in waste ground in low country; common. Fl. July–Oct.; white.

Throughout the Tropics.

A coarse, tough weed, which has the look of an introduced plant. There is a specimen of this in Hermann's Herb., which Linnæus, however, refers to Fl. Zeyl. n. 309 (*Spilanthus Acmella*). Moon gives as the S. name, 'Agada.'

24. **WEDELIA,** *Jacq.*

Perennial herbs or shrubs, l. opp.; heads rather large, solitary, axillary and terminal, involucre campanulate-cup-shaped, bracts few, leafy, receptacle small, flat or convex, with a concave bractlet to each fl., ray-fl. few, ligulate, female, disk-fl. numerous, tubular, bisexual; anth.-bases triangular, style-arms acute; achenes truncate, cuneate, pappus 0 or a ring or crown of scales.—Sp. 45; 4 in *Fl. B. Ind.*

Procumbent herb; heads ¾ in. diam. . . . 1. W. CALENDULACEA.
Semi-scandent shrub; heads over 1 in. diam. . 2. W. BIFLORA.

1. **W. calendulacea,** *Less. Syn.* 222 (1832). **Ran-wan-kikirindi,** *S.*

Herm. Mus. 12. Burm. Thes. 52. Fl. Zeyl. n. 311. *Verbesina calendulacea*, L., Moon Cat. 58. Thw. Enum. 165. C. P. 1756.

Fl. B. Ind. iii. 306. Burm. Thes. t. 22, f. 1. Wight, Ic. t. 1107.

A perennial herb, stem short, procumbent at base and rooting at the nodes, then ascending, cylindrical, slightly rough with adpressed hair; l. few, opp., nearly sessile, oblong-strap-shaped or oblong-oval, tapering to base, acute, sparingly and shallowly serrate or entire, slightly rough with adpressed hair on both sides; heads few, on very long, erect, axillary (apparently terminal) peduncles, about ¾ in. diam., bracts few (5–8), ⅜ in., leafy, oblong, obtuse, inner 2 or 3 much smaller, receptacle flat, with a linear, acute, hyaline, ciliate bractlet to each fl., ray-fl. 8–12, spreading, about equalling bracts, broad, deeply 2-3-toothed, disk-fl. about 20, short, narrowed at base, deeply 5-fid, style-branches long, acute, recurved; achene nearly cylindrical, pubescent, shorter than bractlet, crowned with a shallow ring of short, scarious, ciliate scales.

Damp grassy places up to 4000 ft.; common. Fl. October–February; yellow.

Also in India, Malaya, China, Japan.

Has no scent or taste, but is employed as an alterative in Sinhalese medicine.

2. **W. biflora,** *DC. in Wight, Contrib.* 18 (1834).
Verbesina biflora, L., Moon Cat. 58. *Wollastonia biflora*, DC., Thw. Enum. 165. C. P. 1760.
Fl. B. Ind. iii. 306. Wight, Ic. t. 1108.

A scrambling, semi-scandent shrub, stems semi-woody below, with long opp., horizontal, divaricate branches, thickened at nodes, striate, glabrous; l. on rather long stout curved petioles, 1½–3 in., ovate-oval, cuneate at base, acute, coarsely dentate-serrate, rather rough with adpressed hairs on both sides, venation finely reticulate; heads rather large, 1–1¼ in. diam., on long peduncles, usually in 3's at ends of branches, involucre cup-shaped, bracts few, oval-oblong, obtuse, pubescent, bractlets on receptacle narrow, concave, ray-fl. 9 or 10, not contiguous, spreading, much exceeding inv.-bracts, short, deeply 3-toothed, disk-fl. numerous, the inner ones often sterile; achene pubescent on top without scales.

On the seashore, scrambling over bushes; rather common, especially in the dry region. Bentota (Moon). Fl. all the year; bright yellow.
Tropical Asia generally.
A rather handsome plant when in full flower. The leaves often become succulent in very exposed situations on the shore. A young specimen of (apparently) this in Hermann's Herb. is the basis for Fl. Zeyl. n. 308, *Spilanthus pseudo-Acmella*, L., but Linnæus's references show confusion with *Blainvillea* or *Eclipta*.

Tithonia diversifolia, Gray, a native of Mexico and California, though only introduced as a garden plant so recently as 1851, is now one of the commonest and most conspicuous plants in the island, and is generally known as the 'Wild Sunflower.' It doubtless spread from Peradeniya, but is now completely established by roadsides and waste ground over the whole of the moist region up to 5000 ft., and in places in the dry region also. It has been figured in Godman's 'Biologia Cent.-Americana,' Botany, ii. t. 47 (1881) as *Mirasolia diversifolia*, Hemsl. (See Trimen in Journ. Bot. xxiii. 145.)

25. SPILANTHUS,* *L.*

Annual, l. opp., heads solitary, axillary; involucre shallowly cup-shaped, bracts few, receptacle linear, stalk-like, deeply pitted, with a hyaline bractlet to each fl., fl. numerous, minute, ray-fl. ligulate, fem. (but usually absent), disk-fl. tubular, bisexual, fertile, anth.-bases shortly pointed; style-branches short, truncate; achene compressed, 2-edged, glabrous, pappus o.—Sp. 20; 1 in *Fl. B. Ind.*

---

* Linnæus took this name from Jacquin, who spells it *Spilanthes*, however.

S. Acmella, *L. Syst. Veg. ed.* 13, 610 (1774). **Akmella,** *S.*
Herm. Mus. 17. Burm. Thes. 58. Fl. Zeyl. n. 309. Moon Cat. 57. Thw. Enum. 165. C. P. 684.
Fl. B. Ind. iii. 307. Wight, Ic. t. 1109 (*S. calva*).

Annual, stems prostrate or ascending, much branched, cylindrical, more or less hairy; l. opp., $\frac{3}{4}$–1$\frac{1}{2}$ in., ovate, suddenly tapering at base, acute, faintly and irregularly serrate, glabrous or nearly so, thin, somewhat 3-nerved, petiole long, slender, pilose; heads apparently terminal really axillary, on long glabrous peduncles, ovate-ovoid, bracts leafy, lanceolate, sub-acute, pilose; cor.-tube short, lobes triangular; achene oblong, dark brown, dull.

Moist places up to 6000 ft.; common. Fl. all the year; yellow.
All Tropical countries.
S. pseudo-Acmella, L., is generally referred to this by authors, but it is not now possible to say what was meant by that name. (See under *Wedelia biflora.*)
The heads have a hot, pungent taste, and in a large variety (*S. oleracea*, Jacq.), often found in gardens, this is more strongly developed and gives it, from its use, the name of 'Toothache plant.' I have seen no ray-flowers in the Ceylon plant, nor any pappus.

Synedrella nodiflora, Gaertn., a Mexican plant, is occasionally found as a weed. It is C. P. 3839, and the *Ximenesia encelioides* of Thw. Enum. 422 (non Cav.). It has occurred about Trincomalie and abundantly at Bentota, by the river, and has lately become a troublesome weed at Peradeniya.

Cosmos bipinnatus, Cav., is a frequent weed in waste ground, often in great quantity; and *C. sulfureus*, Cav., is less frequently found in similar places. Both are Mexican annuals, no doubt originally introduced as ornamental garden plants.

26. BIDENS, *L.*

Annual, l. opp., compound; heads solitary, few, terminal, moderate-sized, involucre cup-shaped, bracts in 2 rows, outer leafy, spreading, connate at base, inner membranous, receptacle flat or slightly concave with linear bractlets; ray-fl. in one row, ligulate, female, disk.-fl. tubular, bisexual; anth.-bases sagittate, style-arms of bisexual fl. acute, hairy; achene very narrow, compressed, pappus of 2–4 rigid bristles.—Sp. 50; 3 in *Fl. B. Ind.*

***B. pilosa,** *L. Sp. Pl.* 832 (1753). **Wal-té-kola,** *S.*
B. chinensis, Willd., Moon Cat. 57. Thw. Enum. 165. C. P. 3630.
Fl. B. Ind. iii. 309.

Annual, stem 2–3 ft., erect, quadrangular, thickened at nodes, glabrous or nearly so, with long opp. branches; l.

usually 3- sometimes 5-foliolate, lflts. nearly sessile, ovate, tapering to base, very acute, sharply serrate, glabrous, the terminal one the largest, petiole somewhat dilated and sheathing at base; heads under ½ in. diam., outer inv.-bracts oblong, obtuse, spreading, inner erect, acute; ray-fl. varying from 5–16, strap-shaped, acute, not toothed, or broader, truncate and toothed; achene narrowly linear, black, the upper half hispid, pappus-bristles erect or slightly spreading, rough with long backward-pointing prickles.

Var. β, **bipinnata,** *Hk. f. B. decomposita*, Wall., Thw. Enum. 165. C. P. 3583. Herm. Parad. Bot. t. 123.

Lflts. 5, narrower, much cut, sometimes into separate lflts.; bristles on achene longer.

Cultivated on waste ground; a pestilent weed, very common everywhere. Fl. all the year; ray white, disk yellow.

Found in all warm countries. Probably originally American.

Not recorded by Hermann from Ceylon. A very variable plant; the variety given is scarcely worth distinction. Leaves sometimes very hoary, with copious pubescence on both sides. Known universally as 'Spanish Needle.' Moon gives the S. name above quoted and its English equivalent, 'Ceylon Tea,' the origin of which I have failed to trace.

27. GLOSSOGYNE, *Cass.*

Perennial herb, l. alt., mostly radical and pinnatisect, heads small, solitary, terminal, inv.-bracts in 2 or 3 rows, connate at base, narrow, receptacle convex, with linear bractlets, ray-fl. few, ligulate, female, disk-fl. few, tubular, bisexual, fertile; anth.-bases obtuse, style-arms of bisexual fl. with long hairy tips; achene linear, compressed, glabrous, pappus of 2 hispid spines.—Sp. 5; 1 in *Fl. B. Ind.*

G. pinnatifida, *DC. in Wight, Contrib.* 19 (1834).
Trim. in Journ. Bot. xxvii. 164.
Fl. B. Ind. iii. 310.

Perennial with an erect rootstock, often branched at summit, l. mostly radical, erect, 4–6 in. including long petiole into which it tapers insensibly, triangular-rhomboid in outline, very deeply pinnatisect, lobes few, linear, acute, the larger ones again pinnatisect, glabrous, rather rigid, veins prominent beneath; flowering stems about 1 ft., slender, stiff, glabrous, slightly dichotomously branched with a small pinnatisect l. at each fork; heads few, inv.-bracts obtuse; glabrous; ray-fl. about 5, spreading, 3-toothed; achene strongly striate, dark brown, glabrous, pappus-spines rough with backward pointing prickles.

Dry country; very rare. Nilgala Hill and about Bibile and Ekiriankumbura, Uva. Fl. Dec.; yellow.

Also in Peninsular India.

Galinsoga parviflora, Cav., is occasionally found as a garden weed in the hill country. It is native to Peru and Chili, but naturalised in many warm temperate countries.

Tridax procumbens, L., has recently become a troublesome weed in cultivated ground, probably introduced from India, where it is common. It is a native of S. America.

Tagetes erecta, L., and *T. patula*, L., the so-called African and French marigolds—but both natives of Mexico—are universally cultivated by the natives, and are commonly met with in a semi-wild condition.

Cotula australis, Hk. f., occurs occasionally as a roadside weed about Nuwara Eliya, in Dimbula, &c. It comes from Australia and New Zealand.

28. **CENTIPEDA,** *Lour.*

Annual, prostrate, l. alt.; heads minute, globose, axillary, involucre spreading, bracts few, in 2 rows, receptacle convex, naked; fl. numerous, very small, all tubular, the outer (often numerous) rows female, fertile, the inner rows fewer, bisexual, often 4-lobed; anth.-bases obtuse; style-arms short truncate; achene 4-angled, truncate, pappus 0.—Sp. 3; 1 in *Fl. B. Ind.*

C. orbicularis, *Lour. Fl. Cochinch.* 493 (1790). **Wisaduli,** *S.*

Cotula minima, W., Moon Cat. 58. *Myriogyne minuta*, Less., Thw. Enum. 165. C. P. 2715.

Fl. B. Ind. iii. 317. Wight, Ic. t. 1610 (*Dichrocephala Schmidii*).

A small annual with very numerous, prostrate, slender, branching stems spreading from a centre; l. numerous, sessile, very small, $\frac{1}{4}$–$\frac{3}{8}$ in., oblong, spathulate, tapering to base, acute, with 2 sharp teeth on each side, glabrous; heads nearly sessile, globose, $\frac{1}{8}$ in., inv.-bracts very small, obtuse, with membranous margins; achene minute, tipped with persistent style, bristly on the angles.

Damp places, lower montane zone; rather rare. Maturata; Dolosbagie; Maskeliya, &c.; probably often overlooked. Fl. Feb., March; yellow.

In the Eastern Tropics generally.

I am assured that it is to this plant that the name 'Wisaduli' (as to which see under *Wisadula* and *Cymbidium*) is applied by the vederales of the Central Province. The name signifies a powder used for swellings and inflammation. Moon gives 'Hin-kimbu' as the S. name. It is used to promote sneezing in headaches and colds in the head.

29. **ARTEMISIA,** *L.*

Perennial, l. alt., deeply pinnatisect, heads very small, numerous, in spicate infl.; involucre ovoid, bracts few, im-

bricate, inner very obtuse, membranous, receptacle naked, fl. all tubular, outer row female, fertile, disk-fl. few, bisexual; anth.-bases obtuse; style-branches of bisexual fl. short, truncate, with tuft of hair at end; achene very small, oblong, striate, pappus 0.—Sp. 150; 27 in *Fl. B. Ind.*

***A. vulgaris,** *L. Sp. Pl.* 848 (1753). **Wal-kolondu,** *S.*
A indica, Willd., Moon Cat. 58. Thw. Enum. 165. C. P. 1755.
Fl. B. Ind. iii. 325. Wight, Ic. t. 1112 (*A. indica*).

Perennial, semi-shrubby, stems erect, 2–3 ft., virgate, slightly cottony, l. numerous, 2–4 in., broadly oval in outline, very deeply pinnatisect, the upper segm. large, the lower very small, and the basal ones stipule-like, all again cut into narrow acute mucronate segm., pilose or glabrous above, densely cottony-pubescent and white beneath, uppermost lanceolate, entire; heads solitary or two or three together, sessile or stalked in axils of l., and forming long spicate leafy infl., outer in.-scales slightly pubescent.

Roadsides and waste places; rather common, but only as an escape from gardens, and scarcely to be included in our flora. Fl. brownish-yellow.

Throughout temperate Asia and Europe, Siam, and Java.

Leaves, &c., sweetly aromatic. A variety of the common 'Mugwort' of England.

30. **GYNURA,** *Cass.*

Biennial or perennial herbs, l. alt.; heads of moderate size, in terminal inflor., involucre oblong-cylindrical or campanulate, with several filiform spreading bracts at base, and a single row of erect narrow ones with membranous margins, receptacle flat or convex, glabrous, fl. numerous, all tubular and bisexual; anth.-bases not tailed or sagittate; style-arms long, slender, tapering, hairy; achene narrow, strongly ribbed, pappus of copious white hairs.—Sp. 20; 7 in *Fl. B. Ind.*

L. with large auricles at base.
  L. more or less hispid; achene slightly hairy 1. G. LYCOPERSICIFOLIA.
  L. densely velvety; achene hispid . . 2. G. ZEYLANICA.
L. without auricles at base; achene glabrous . 3. G. HISPIDA.

1. **G. lycopersicifolia,** *DC. Prod.* vi. 300 (1837).
Thw. Enum. 166. C. P. 420, 2826.
Fl. B. Ind. iii. 334.

Perennial herb, stem 2–5 ft., stout, 5-angled, glabrous or slightly hairy, with many spreading branches; l. numerous,

the lower petiolate, the upper sessile, all with a pair of large, auriculate, stipule-like, deeply pinnatisect lfts. at base, the terminal segm. very large ovate acute or cordate at base, the lat. ones few very much smaller unequal dentate-serrate, hispid above, more or less pubescent and paler beneath, rather thick and flaccid, uppermost ones nearly entire; heads on rather long, pubescent, often nodding peduncles with scattered filiform bracts, involucre $\frac{1}{2}$–$\frac{3}{4}$ in., ovate-oblong, with several short filiform bracts at base, inner bracts adnate except at acuminate ends, receptacle rather concave, fl. very numerous, considerably exceeding involucre; cor.-segm. obtuse; style-branches very long, orange; achene linear-oblong, dark brown, with a few short white hairs in the channels, pappus long.

Shady places in the moist region to 6000 ft.; common. Fl. April, October; deep orange.

Also in S. India.

Very variable, and I feel doubtful whether more than one species is not here included. In the hill-jungles it is a very large stout branched herb, with a hispid purple stem often 6 ft. or more high scrambling up amongst other vegetation; the flower-heads are larger, more drooping, and handsome, the leaves more hairy, with the terminal lobe or leaflet very large, and the whole plant suffused with purple colouration. This may be *G. angulosa*, DC.

2. **G. zeylanica,** *Trim.* [PLATE LVIII.]
G. nepalensis, Thw. Enum. 166 (non DC.). C. P. 3539.

A coarse biennial (?) herb, stem 2–3 ft., almost woody below, but not tuberous, very stout, striate, closely pubescent, branched at top; l. numerous, sessile or nearly so, 5–6 in., variable, pinnatisect, with a pair of large, strongly auriculate, stipule-like segm. at base, and 2 or 3 pair of almost distinct, oblong, acute segm. above, and a large terminal one (in lower l. very much the largest), coarsely serrate, thickly and softly pilose or velvety and whitish on both sides; heads rather numerous, on short, densely pubescent, nodding peduncles in a sub-corymbose terminal infl., involucre oblong-ovate, with several spreading, filiform, purple bracts beneath, inner bracts pilose, receptacle convex, fl. slightly exceeding involucre; achene oblong-linear, hispid.

In chinks of rocks, lower montane zone, 3000–4000 ft.; restricted to Uva Province. Frequent at Etampitiya, Lunugala, Passara, &c.; Galagama (Thwaites). Fl. Jan.–May; bright yellow (not orange).

This fine plant is undoubtedly near *G. nepalensis*, to which Thwaites referred it; but the leaves are more cut and velvety. It is included in Fl. B. Ind. under *G. pseudo-China*, DC., which is a much smaller plant with a tuberous root, nearly glabrous, and with fewer stem-leaves (see under *G. hispida*).

3. **G. hispida,** *Thw. Enum.* 166 (1860).
Clarke, Comp. Ind. 172.
Fl. B. Ind. iii. 335 (*G. pseudo-China*, var.).

Perennial, stem 1–3 ft., stout, fleshy, naked below, and marked with scars of fallen l., hispid with yellow hair, unbranched; l. numerous, closely placed on lower part of stem, 3–4 in., tapering into obscure petiole, oval-oblong, acute, entire or undulate or sparingly serrate, densely covered with crisp, yellow, bristly hair on both sides; heads few, 2–6, on long, erect, hispid or glabrous peduncles, rather large, involucre campanulate, outer bracts filiform, spreading, inner row lanceolate, acuminate, with broad membranous border, receptacle flat, fl. numerous, exceeding involucre; achene glabrous, pappus long.

On rocky places on the patanas of upper montane zone above 6000 ft.; rare. Horton Plains (Thwaites); Hakgala (Nock). Fl. May; orange-yellow.

Endemic.

This is in Fl. B. Ind. referred as a variety to *G. pseudo-China*, DC. I have not been able to obtain roots hitherto, and am thus unable to say if it possesses the tuberous rhizomes characteristic of that species; but it does not otherwise greatly resemble it. *G. pseudo-China* is excellently figured from a cultivated Madras specimen in Dillenius' Hort. Elth. ii. t. 258, and is commonly grown here in native gardens under the name of 'Ala-bet,' or China-root. Moon (Cat. 57) gives it under the name of *Cacalia cathartica.* Another species is grown in China for its roots—*G. auriculata*, Cass.—which is the *G. pseudo-China* of Benth. Fl. Hongk. 189 (not of DC.).

31. **EMILIA,** *Cass.*

Perennial herbs, l. alt., sessile; heads rather small, on long peduncles, involucre cylindrical, bracts about 8 in one row, connate to near the top, receptacle flat, naked, fl. numerous, all tubular and bisexual; anth.-bases obtuse; style-arms tipped with a conical tuft of hair; achene ribbed, scabrous on the ribs, pappus copious, white.—Sp. 5; all in *Fl. B. Ind.*

Sagittate upper l. with acute auricles . . . 1. E. SONCHIFOLIA.
Sagittate upper l. with rounded auricles . . . 2. E. ZEYLANICA.

1. **E. sonchifolia,** *DC. in Wight, Contrib.* 24 (1834). **Kadupara,** *S.*
Herm. Mus. 32. Burm. Thes. 61. Fl. Zeyl. n. 305. *Cacalia sonchifolia*, L. Sp. Pl. 835. Moon Cat. 57. Thw. Enum. 167. C. P. 3343.
Fl. B. Ind. iii. 336. Rheede, Hort. Malab. x. t. 68.

Stems prostrate or decumbent at base often rooting, then erect, much branched, glabrous; l. 1½–2 in., on the barren shoots somewhat lyrate, with the upper half ovate, and the

lower narrow and oblong, on the flowering branches oblong or lanceolate-oblong, sagittate, with acute auricles at base, all subacute, hairy on both sides, rather thick, glaucous beneath; heads few, nodding when young, about $\frac{1}{2}$ in. wide, involucre over $\frac{1}{4}$ in., nearly glabrous, fl. much exceeding involucre, outer ones spreading, achene oblong, brown, with white bristles on the ribs.

An abundant weed throughout the island, especially in grass. Fl. all the year; bright pale pinkish-violet, very rarely white.

Throughout the Old World Tropics.

Extremely variable in appearance, according to locality.

2. **E. zeylanica,** *Clarke, Comp. Ind.* 175 (1876).

E. prenanthoidea, Thw. Enum. 167 (non DC.). C. P. 430 (444, 581, 670).

Fl. B. Ind. iii. 336.

Stems slender, much elongated, glabrous, purplish; l. 2–4 in., oblong- or lanceolate-linear, acute, the lower ones narrowed into a long base, the upper strongly sagittate with large rounded auricles, all distinctly denticulate, glabrous and shining above, glaucous and finely pilose beneath, rather thick; heads few, nodding on long glabrous peduncles, involucre $\frac{1}{4}$–$\frac{3}{8}$ in. long, fl. somewhat exceeding involucre; achene black with white bristles on the ribs.

Var. β, **Walkeri,** *Trim.* *E. Walkeri*, Hk. f. in Fl. B. Ind. iii. 337.

Stem stouter and longer, stiff, wiry, polished; l. larger, 3–4$\frac{1}{2}$ in., oblong or triangular-oblong, much dilated and stem-clasping at base, the lower ones often contracted about the middle so as to be fiddle-shaped, all more or less coarsely dentate; involucre larger $\frac{3}{8}$–$\frac{1}{2}$ in., heads larger, about $\frac{5}{8}$ in. wide.

Upper montane zone above 6000 ft.; common. Var. β about N. Eliya; Pedurutalagala; Adam's Peak. Fl. all the year; pinkish-mauve or mauve, var. β usually paler.

Endemic.

I cannot distinguish two species here (as in Fl. B. Ind.), indeed, I suspect this is merely a montane form of *E. sonchifolia*. The stems of var. β are sometimes over 6 ft. in length when straggling amongst bushes.

32. **NOTONIA,*** *DC.*

Shrubby, l. alt.; heads rather large, in large lax terminal infl., involucre oblong-cylindrical, bracts in one row, narrow,

* Dedicated to Benjamin Noton, of Bombay, who collected largely in S. India, especially in the Nilgiri Hills.

with membranous margins, receptacle flat, naked, fl. all tubular and bisexual (fertile); cor. long, slender, 5-fid; anth.-bases obtuse, style-branches long, blunt or truncate, often tufted with hair at end; achene long, finely ribbed, pappus copious, hairs fine, long, white.—Sp. 5; 3 in *Fl. B. Ind.*

L. very obtuse . . . . 1. N. GRANDIFLORA.
L. acuminate, acute . . . 2. N. WALKERI.

1. **N. grandiflora,** *DC. in Wight, Contrib.* 24 (1834).
Thw. Enum. 168. C. P. 1743.
Fl. B. Ind. iii. 336. Wight, Ic. t. 484. (*N. corymbosa*).

A semi-shrubby perennial, 2–6 ft., stems cylindrical, fleshy, scarcely branched, marked with scars of fallen l., very glabrous and covered with a white easily detached 'bloom,' pale green; l. 2½–5 in., oval-oblong, tapering to base, rounded at apex, entire, glabrous, pale glaucous-green especially beneath, and often covered with white 'bloom,' rather fleshy, petiole short, stout; heads solitary, few, large, nodding, terminating long divaricate branches of the large very lax spreading infl., peduncles glabrous, with scattered leafy bracts, involucre ¾ in. long, narrowly oblong-cylindrical, bracts about 8, connate except at ends, glabrous, very pale green or purplish, fl. numerous, much exserted, style branches very long; achene linear, ¼ in., glabrous.

Dry region, on the coast; very rare. Batticaloa; Trincomalie; Karativu, Kalpitiya. Fl. Jan.–March, August; greenish-white, styles yellow.

Also in S. India.

Often grown in gardens.

2. **N. Walkeri,** *Clarke, Comp. Ind.* 176 (1876).
Senecio Walkeri, Thw. Enum. 167. Wight, Ic. iii. pt. 4, 11. C. P. 533.
Fl. B. Ind. iii. 337. Wight, Ic. t. 1122 (*Gynura Walkeri*).

A shrub, 6–7 ft., stems softly woody at base and marked with scars of fallen l., cylindrical, glabrous, scarcely branched; l. rather closely placed on upper part of stem, 4–5 in., tapering into long petiole, lanceolate, acuminate, acute, serrate or crenate, glabrous, rather thick; heads numerous, moderate-sized, stalked, forming a very large loose corymbose infl., peduncles glabrous, with linear bracts, involucre cylindrical, bracts glabrous, linear; fl. not numerous; achene slightly compressed, finely hairy on the ribs.

Upper montane zone; rare. Nuwara Eliya; Horton Plains; summit of Wattekelle Hill (Ferguson). Fl. Sept., Oct., April; pale yellow or nearly white.

Also in the Nilgiris.

33. **SENECIO,** *L.*

Perennial herbs or shrubs, often scandent, l. alt., heads rather small, in corymbose cymes; inv.-bracts in one row, few, erect, narrow, sometimes connate, often with a few short filiform ones at base, receptacle flat, smooth, ray-fl. fem., ligulate, disk-fl. tubular, bisexual; anth.-bases rounded or tailed; style-arms of bisexual fl. truncate, recurved; achene narrow, terete or compressed, ribbed, smooth or hairy, pappus hairs copious, white or yellowish.—Sp. about 900; 63 in *Fl. B. Ind.*

Erect; anth.-bases obtuse.
  L. linear, entire, margin revolute . . . . 1. S. GRACILIS.
  L. linear, dentate-serrate, margin not revolute . 2. S. GARDNERI.
  L. oval or oblong, more or less pinnatifid . . 3. S. LUDENS.
Climbing; anth.-bases tailed.
  L. simple, stalked, cordate.
    L. cottony, ultimately glabrous . . . . 4. S. WALKERI.
    L. permanently tomentose beneath . . . 5. S. CORYMBOSUS.
  L. pinnate, sessile, with auricles . . . . 6. S. SCANDENS.

1. **S. gracilis,** *Arn. Pug.* 31 (1836).
S. zeylanicus, DC. Prod. vi. 365. Thw. Enum. 167. C. P. 1749.
Fl. B. Ind. iii. 340 (*S. zeylanicus*).

Perennial, stem 1–2 ft., erect, slender, glabrous or slightly cottony, almost unbranched; l. few, sessile, 2–4 in., oblong-linear, slightly widened at base, acute, entire, margin strongly revolute, glabrous or slightly cottony above, cottony beneath, midrib very thick and prominent beneath; heads solitary, rather small, $\frac{1}{2}$ in. diam., on long slender erect peduncles in a very lax infl., involucre ovoid-oblong, bracts linear, acuminate, acute, connate except at top, glabrous, ray-fl. about 12, cor. very slightly 3-toothed; achene finely ribbed, glabrous, pappus white.

On patanas in upper montane zone; rather common. Fl. April, November; lemon-yellow.
Also in the Pulni Hills, S. India.

2. **S. Gardneri,** *Clarke, Comp. Ind.* 202 (1876).
Doronicum Gardneri, Thw. Enum. 167. C. P. 435.
Fl. B. Ind. iii. 343.

Perennial, stem glabrous; l. numerous, crowded, sessile, $1\frac{1}{2}$–3 in., linear, much tapering to base, acute, coarsely dentate-serrate, glabrous, paler beneath; heads small on long peduncles in a very lax terminal infl., involucre short, cup-shaped, bracts linear, glabrous; achene densely pilose, whitish-grey, pappus yellowish.

Lower montane zone; very rare. Adam's Peak (Gardner); Ambagamuwa (Thwaites). Fl. March; yellow.
Endemic.

3. **S. ludens,** *Clarke, Comp. Ind.* 199 (1876).
Doronicum Walkeri, Arn. Pug. 32. Thw. Enum. 167. C. P. 151.
Fl. B. Ind. iii. 345.

Perennial, 6 in.–2 ft., stem erect, scarcely branched, cylindrical, roughly hairy, often purple; l. rather numerous, very variable even on the same plant, 1–6 in., the lower stalked, the upper sessile, oval or oblong, more or less dentate, or lacerate, or pinnatifid, or even pinnate, acute, often auriculate at base, more or less rough with harsh hairs on both sides, rather fleshy, often purple beneath; heads numerous or few, on long erect peduncles with scattered linear bracts, about $\frac{3}{4}$ in. diam., involucre short, campanulate, bracts connate, acuminate and purple at ends, glabrous, ray-fl. usually 8, spreading, cor. limb oval-oblong, minutely 3-toothed; achene oblong, 4-ribbed, ribs hispid with white bristles, pappus short, pale brown.

On the patanas, especially in damp places, montane region above 4000 ft.; very common. Abundant on summit of Adam's Peak, also in Concan, S. India. Fl. October–March; bright yellow.
An extremely variable plant in foliage and habit. In dry places it has a very slender, erect stem, with only 2 or 3 heads.

4. **S. Walkeri,** *Arn. Pug.* 31 (1836).
DC. Prod. vi. 364. *S. araneosus*, var. *Walkeri*, Clarke, Comp. Ind. 182.
S. corymbosus, var., Thw. Enum. 167, 422 (non Wall.). C. P. 272, 565.
Fl. B. Ind. iii. 351 (*S. araneosus*). Wight, Ic. t. 1131.

A semi-shrubby climber, stems slender, flexuose, usually pubescent and slightly cottony; l. numerous, $1\frac{1}{2}$–3 in., nearly as broad as long, deeply cordate at base, acute, irregularly denticulate, usually cottony on both sides when young, but becoming glabrous at least on upper side when mature, finely reticulate, veins pellucid, petiole $1–1\frac{1}{2}$ in., prehensile; heads very numerous, small, shortly stalked, in corymbose clusters at ends of branches of rounded axillary and terminal stalked paniculate infl., inv.-bracts few, oval-oblong, acute, glabrous, fl. few, style-arms long and much exserted, circinately curved; achene glabrous, pappus yellowish-white.

Montane zone up to 7000 ft.; rather common. Fl. Jan., Feb.; white.
Also in the Himalayas, Nilgiris, and in Java.
S. araneosus, DC., is, doubtless, the same, but Arnott's name has priority. Walker's original specimens have the adult l. quite glabrous, and thus agree with C. P. 565.

5. **S. corymbosus,** *Wall. Cat. n.* 3121 (1828).
S. araneosus, var. *corymbosus*, Clarke, Comp. Ind. 182. C. P. 3894. Fl. B. Ind. iii. 351. Wight, Ic. t. 1130.

A climbing shrub, differing from *S. Walkeri* in having the l. densely and permanently covered beneath with a grey or cinnamon-coloured felt and the inv.-scales cottony-pubescent.

Lower montane zone, 3000–4000 ft.; rare. Ambagamuwa (Thwaites); Debedde, near Badulla. Fl. Jan., Feb.; white.

Also in the Nilgiris.

Very near *S. Walkeri*, but probably distinct. Clarke, however, combines them. Thwaites had not seen the true plant when he published his Enum.

6. **S. scandens,** *D. Don, Prod. Fl. Nep.* 178 (1825).
S. Wightianus, DC. in Wight, Contrib. 22. Thw. Enum. 167. *S. campylodes*, DC., var. *Wightianus*, Clarke, Comp. Ind. 184. C. P. 1751. Fl. B. Ind. iii. 352. Wight, Ic. t. 1136 (*S. Wightianus*).

Perennial, stems scandent, much divaricately branched, very zigzag, grooved, glabrous or nearly so; l. 1½–2 in., sessile, usually compound, with a large, narrowly triangular, very acute, terminal lflt., and 2 or 3 pairs of small, unequal, oblong or linear lflts., the basal pair stipule-like, stem-clasping, and auriculate, all sharply dentate, glabrous, finely pellucid-reticulate; heads small, on long, slender, very divaricate peduncles, in lax, rounded, terminal, or axillary infl., involucre narrowly campanulate, bracts linear, acute, with membranous margins, glabrous, ray-fl. about 8; achene compressed, 4-angled, glabrous or with a few bristly hairs on ribs, pappus white or yellowish.

Moist region from 1500–4000 ft.; common. Fl. Jan., Feb.; yellow.

In the Himalayas and Nilgiris, and extending into China.

A very graceful and pretty plant, climbing by means of its zigzag stems and branches.

34. **CREPIS,** *L.*

Annual or perennial herbs, l. mostly radical, heads small, in large, terminal, corymbose cymes, involucre narrow, bracts few, erect, narrow, with a few very short ones at base, fl. few, all ligulate, bisexual, anth.-bases rounded; achene narrowed at top but not beaked, ribbed, glabrous, pappus copious, white or grey.—Sp. 130; 14 in *Fl. B. Ind.*

Both our species belong to Sect. *Youngia*, which in habit is more like *Lactuca* than *Crepis*.

Heads ⅙ in. long; pappus white . . . . . 1. C. JAPONICA.
Heads ⅓ in. long; pappus smoky-grey . . . . 2. C. FUSCIPAPPA.

1. **C. japonica,** *Benth. Fl. Hongk.* 194 (1861).
Youngia lyrata, Cass., Thw. Enum. 168. C. P. 1747.
Fl. B. Ind. iii. 395. Wight, Ic. t. 1147 (*Youngia napifolia*).

Annual, stem 8–18 in., erect, simple, glabrous or slightly hairy, slender; l. nearly all radical, 3–6 in., on longish petioles, oblong-lanceolate, tapering at base, very obtuse or rounded at apex, lower part more or less deeply cut or pinnatifid, margin denticulate, glabrous on both sides, membranous; heads very small, barely $\frac{1}{4}$ in. wide, numerous, stalked, forming large, lax, divaricate, terminal infl., inv.-bracts few, $\frac{1}{6}$ in., erect, acute, glabrous, fl. spreading; achene compressed, many-ribbed, glabrous, dark brown, pappus white.

A weed in damp shady places; very common up to 6000 ft. Fl. all the year; yellow.

Throughout India, Malay Peninsula, China, Japan, and Mauritius.

2. **C. fuscipappa,** *Clarke, Comp. Ind.* 254 (1876).
Youngia fuscipappa, Thw. Enum. 168. C. P. 1748.
Fl. B. Ind. iii. 395.

Perennial herb, 9–18 in. high, with a small rootstock, stems several, erect, slender, glabrous, often flexuose below; l. mostly radical on lower part of stems, $1\frac{1}{2}$–6 in., much tapering at base into very long petiole, oblong-linear, attenuate at both ends, irregularly and deeply laciniate or sinuate, upper ones narrowly linear, entire, all glabrous; heads solitary, on long, slender, erect peduncles, forming a very lax infl., involucre oblong-cylindrical, bracts $\frac{1}{3}$ in., erect, obtuse, quite glabrous, 3-veined, bluish-green, with narrow membranous margins, outer ones very short, adpressed, rotundate; achene much narrowed at top but scarcely beaked, finely ribbed, glabrous, brown, pappus smoky-grey.

In wet grassy places, montane zone; rather rare. Maturata; Haputale; Horton Plains, abundant. Fl. May, Aug., November; yellow.

Also in the Himalaya.

Taraxacum officinale, Wigg., the Dandelion, introduced at Hakgala Garden in 1882, has already established itself on the damp sides of the Badulla Road below the Garden, and is likely to spread in the hill-country.

35. LACTUCA, *L.*

Biennial herb, l. alt.; heads rather small, in little clusters on sides of long branches, involucre very narrow, bracts few, the outer very short, the inner long, narrow, receptacle small, flat, fl. few, all ligulate, bisexual; anth.-bases sagittate, style-arms slender; achene narrow, compressed, tapering into short

beak, much muriculated, pappus abundant, white.—Sp. 60; 22 in *Fl. B. Ind.*

L. Heyneana, *DC. Prod.* vii. 140 (1838).
Prenanthes sonchifolia, Willd., Moon Cat. 57. *Brachyrhamphus sonchifolius*, Thw. Enum. 168 (non DC.). C. P. 2827.
Fl. B. Ind. iii. 403. Wight, Ic. t. 1146 (*Brachyrhamphus*).

Herb, stem erect, 3–6 ft., branched above, cylindrical, very glabrous, glaucous; l. mostly radical, sessile, large, 4–12 in., basal ones obovate, obtuse, the others oblong, deeply runcinate-pinnatifid, with acute spreading segm., all ciliate-spinulose on margin, glabrous on both sides, thin, stem-l. narrower, stem-clasping and auriculate at base; heads shortly stalked in small clusters (or solitary), distantly placed on long, wiry, leafless, ascending branches; inner inv.-bracts obtuse, with broad membranous margin, glabrous, fl. 12–16, spreading; achene black, beak dilated at summit.

Low country, on old walls and rubbish, principally in the dry region; rather rare. Galle (Moon); Anuradhapura, about the ruins abundant; Jaffna. Fl. Aug.–Oct., Feb.; pinkish-white.
Also in Peninsular India.

Sonchus asper, Vill., and *S. oleraceus*, L., the common Sowthistles of England, are commonly found as weeds in cultivated ground. The latter is C. P. 3631, and is figured in Wight, Ic. t. 1141 as *S. ciliatus*.

36. **LAUNÆA,** *Cass.*

Perennial prostrate herb, l. in fascicles; heads solitary at the nodes, rather large, involucre narrow, bracts in several rows, outer ones shorter, fl. all ligulate and bisexual, anth.-bases sagittate, style-arms slender; achene narrow, not compressed, very broadly ribbed, not beaked, pappus copious, white, readily detached—Sp. 20; 7 in *Fl. B. Ind.*

L. pinnatifida, *Cass. in Ann. Sc. Nat.* xxiii. 85 (1831).
Prenanthes sarmentosa, Willd., Moon Cat. 57. *Microrhynchus sarmentosus*, DC., Thw. Enum. 168. C. P. 1746.
Fl. B. Ind. iii. 416. Wight, Ic. t. 133 (*M. sarmentosus*).

A perennial herb, sending off long, prostrate, wiry, glabrous branches, with very long arched internodes, and rooting at every node; l. radical, and in fascicles at the nodes, 1–2 in., sessile, oblong, tapering to base, acute, more or less deeply runcinate or pinnatifid, slightly denticulate, glabrous; heads about 1 in. wide, on short, stout, erect, usually bracteated peduncles, inv.-bracts obtuse, with membranous margins, glabrous, fl. about 12,

cor. large, 5-toothed, recurved; achene, with 4 very broad ribs glabrous, pale brown.

Sands of the seashore round the whole island; common. Fl. Feb., March, August; lemon-yellow.
Coasts of India, Egypt, E. Africa, and Mauritius.

LXXI.—STYLIDIACEÆ.

ANNUAL herb, l. radical; fl. small, irregular, bisexual, in racemose cymes; cal.-tube adnate to ov., segm. 5; cor. 5-lobed, the lowest one much the smallest; stam. 2, epigynous, fil. adnate with style to form a column, anth. distinct; ov. inferior, 2-celled, with numerous ovules on middle of dissepiment; fruit a capsule dehiscent from top into 2 valves; seeds minute, numerous, with fleshy endosperm.

An Order which is almost wholly Australian.

STYLIDIUM, *Sw.*

For characters, see Order.—Sp. 85; 3 in *Fl. B. Ind.*

S. uliginosum, *Swartz in Mag. Nat. Ges. Berlin*, i. 52 (1807).
DC. Prod. vii. 336. Thw. Enum. 168. C. P. 3505.
Fl. B. Ind. iii. 420. Swartz, l. c. t. 2, f. 4.

Annual, 3–6 in. high; stem very slender, nearly leafless, glabrous; l. nearly all radical, shortly petioled, very small, $\frac{1}{4}$–$\frac{3}{8}$ in., oval, tapering to base, rounded at apex, glabrous; fl. very small, few, distant, nearly sessile in elongated terminal racemose cymes, each with a small bract; cal.-segm. linear; cor. scarcely longer than cal.-segm., upper lobes bifid, capsule narrowly linear, over $\frac{1}{4}$ in., capped with persistent cal.-segm.

Moist low country near sea level; very rare. I have seen only the C. P. specimens collected near Colombo by Ferguson. First found by Kœnig. Fl. June; white.
Also at Malacca, and in S. China and N. Australia, but not in Peninsular India.

LXXII.—GOODENOVIACEÆ.

SHRUBS, l. alt., without stip.; fl. regular, bisexual, in axillary cymes; cal.-tube adnate to ov., segm. 5 or absent; cor. at first tubular, soon splitting down the back to the base, lobes 5, induplicate-valvate; stam. 5, distinct, epigynous; ov. inferior, 2-celled, with one erect ovule in each cell, style simple, stigma surrounded by a short membranous tube or cup; fruit a drupe, with copious juicy flesh and a bony 2-celled stone; seeds with endosperm.

This family also is Australian for the most part. Our two species are seashore plants.

SCÆVOLA, *L.*

For characters, see Order.—Sp. 60; 2 in *Fl. B. Ind.*

L. over 6 in.; cal.-segm. linear; fr. white . . . 1. S. KŒNIGII.
L. under 3 in.; cal.-segm. 0; fr. purple . . . . 2. S. PLUMIERI.

1. **S. Kœnigii,** *Vahl, Symb. Bot.* iii. 36 (1794). **Takkada,** *S.*
Herm. Mus. 45. Burm. Thes. 29. Fl. Zeyl. n. 313 and 489 (*Takkada*). *S. Lobelia*, L. Syst. Veg. 13 (part). *Lobelia Taccada*, Gaertn. Fruct. i. 119. Moon Cat. 14. Thw. Enum. 169. C. P. 3632.
Fl. B. Ind. iii. 421. Wight, Ill. t. 137 (*S. Taccada*).

A large bush, 6–10 ft. high, woody below, branches very stout, cylindrical, glabrous and shining, pale green; l. very numerous, sessile, large, 6–9 in., obovate, tapering to base, rounded at apex, slightly repand-dentate in upper part, glabrous on both sides, rather thick but not fleshy, recurved, concave beneath, pale bright green, midrib very stout; fl. rather large, on short pubescent ped., arranged in short, flat, dichotomous, axillary cymes very much shorter than l. and with small bracts at the bifurcations, buds clavate, obtuse; cal. pubescent, segm. short, linear, acute, persistent; cor.-tube nearly $\frac{3}{4}$ in., curved, stiff, hairy within, lobes spreading, shorter than tube, obovate-oval, obtuse, the centre thick and stiff, the sides thin, irregularly toothed and ciliate, the cilia long, coarse, and filiform at the base; style over $\frac{3}{4}$ in., strongly curved, very hairy, protruded through the split back of cor.-tube, cup around stigma deep, strongly hairy, ciliate; drupe about $\frac{3}{4}$ in., oblong-globose, somewhat lobed, very succulent, white, crowned with persistent cal.-segm., stone rough, bony.

On the seacoast; common, especially in the South-west parts. Fl. November, May; white, tube greenish-yellow.

Throughout the shores of India, Tropical E. Asia, Polynesia, and Australia.

Hermann's drawing referred to by Linnæus (Fl. Zeyl. n. 313) represents this species, and not *S. Plumieri;* there is no specimen. The large succulent drupe is quite white. The stems of large plants attain 2 ft. or more in circumference.

2. **S. Plumieri,** *Vahl, Symb. Bot.* ii. 36 (1794). **Hin-Takkada,** *S.*
S. Macræi, De Vriese Goodenov. 30. Thw. Enum. 169. Moon Cat. 14. C. P. 1777.
Fl. B. Ind. iii. 421 (*S. Lobelia*). Wight, Ic. t. 1316 (*S. uvifera*).

A small shrub, l. small, $1\frac{1}{2}$–3 in., obovate-oval, tapering to base, rounded at apex, quite entire, fleshy; fl. usually in small axillary cymes of 3, the central one sessile; cal.-segm. 0, or very short and obtuse; drupe nearly globose, smooth, purple, without a crown of cal.-segm. Otherwise as in *S. Kœnigii.*

Seacoast; rare, and chiefly in the dry districts. Kachavallai (Gardner); Trincomalie; Chilaw; Colombo. Fl. white.

Also in S. India and on the Tropical shores of both hemispheres.

Linnæus's *S. Lobelia* included both species, and there is no good reason for restricting his name to this one, as in Fl. B. Ind.

LXXIII.—CAMPANULACEÆ.

HERBS, l. alt., without stip., fl. regular or irregular, bisexual; cal.-tube adnate to ov., segm. 5; cor. (rarely absent) either 2-lipped and cleft down back to base or regular, lobes 5, valvate; stam. 5, epigynous (in *Sphenoclea* inserted on base of cor.-tube), fil. distinct or rarely connate, anth. distinct or connate into a tube; ov. inferior (in *Sphenoclea* half-superior), 2- or 3-celled, with numerous ovules, stigma 2- or 3-lobed; fruit a capsule, variously dehiscent; seeds numerous, small, with endosperm.

Cor. 2-lipped, dorsally cleft to base (*Lobelieæ*) 1. LOBELIA.
Cor. regular, 5-lobed (*Campanuleæ*).
  Capsule dehiscent on top by 3 valves . . 2. WAHLENBERGIA.
  Capsule dehiscent by a deciduous lid . . 3. SPHENOCLEA.
  Capsule dehiscent at base or sides . . 4. CAMPANULA.

An Order here badly represented by eight species, all of which, save *Sphenoclea*, are found in the hill-country; the three small species or varieties of *Lobelia* also extend into the moist low country.

1. **LOBELIA,** *L.*

Herbs, l. alt., fl. solitary or in long erect racemes; cal.-tube adnate to ov., segm. 5, persistent; cor. irregular, split down the back to the very base, 2-lipped, upper lip 2- lower 3-lobed; stam. 5, epigynous, fil. distinct or connate, anth. connate; ov. inferior, 2-celled, with large placentas and very numerous ovules, style simple, stigma 2-lobed; fruit a capsule, dry, dehiscent loculicidally by 2 short valves on the top; seeds minute.—Sp. 200; 15 in *Fl. B. Ind.*

Small prostrate herbs; fil. distinct.
 Seeds ovoid, obtuse . . . . . . 1. L. ZEYLANICA.
 Seeds trigonous.
  Leaves glabrous . . . . . . 2. L. TRIGONA.
  Leaves more or less hairy . . . 3. L. AFFINIS.
Very large erect herb; fil. connate . . 4. L. NICOTIANÆFOLIA.

1. **L. zeylanica,** *L. Sp. Pl.* 932 (1753).
Burm. Thes. 53. Moon Cat. 14. *L. Sebæ*, A. DC. Prod. vii. 386. *L. trigona*, Thw. Enum. 169 (in part). C. P. 1776 (part).
Fl. B. Ind. iii. 425.

Stem prostrate or erect, much branched, 4–12 in. long, slightly hairy; l. sessile, $\frac{1}{2}$–$\frac{3}{4}$ in., rounded, ovate or rhomboid, narrowed to base, coarsely toothed, glabrous; fl. small, solitary, axillary, ped. longer than l.; cal.-segm. linear, shorter than tube; seeds ovoid, obtuse.

Var. β, **Walkeri,** *Clarke in Fl. B. Ind. l. c.*

Stems longer and more prostrate; l. petiolate, ovate.

Moist places, paddy-fields, &c., probably common in the south of the island, but I have not kept notes of the distribution. Var. β, apparently commoner, extends in montane zone to 7000 ft. Fl. Feb.; pale violet.

Also in Malabar.

Thwaites did not distinguish this from the two following, but the shape of the seeds affords a ready distinction. Clarke has determined *L. zeylanica*, *L.*, by examination of the type specimen in Linnæus's own herbarium. *L. Sebæ* is based on a very rough figure (Seba, Thesaurus, 1734) which does not show the seed.

2. **L. trigona,** *Roxb. Fl. Ind.* i. 506 (1832).
Thw. Enum. 169. C. P. 1776 (part).
Fl. B. Ind. iii. 423. Wight, Ic. t. 1170.

Stems elongated, prostrate, rooting at the nodes, trigonous, glabrous; l. sessile or shortly petioled, $\frac{1}{2}$–$\frac{3}{4}$ in., ovate, acute, crenate-serrate, glabrous; ped. longer than l.; cal. glabrous, segm. longer than tube; seeds trigonous.

Damp ground, very common up to the highest elevations. Fl. April, October; pale violet.

Throughout India and Burma.

Only distinguishable from *L. zeylanica* by the form of the seed.

3. **L. affinis,** *Wall. Cat.* 1311 (1828).
L. trigona, Thw. Enum. 169 (part), non Roxb. C. P. 2981.
Fl. B. Ind. iii. 424.

Stem stout, prostrate, much branched, rooting at the nodes below, more or less sharply trigonous, nearly or quite glabrous; l. $\frac{1}{2}$–1 in., broadly ovate, rounded at base, subacute, crenate denticulate, more or less hairy on both sides, especially on veins beneath, petiole distinct, $\frac{1}{8}$–$\frac{3}{8}$ in.; ped. as long as or longer than l., slightly hairy; cal. with many bristly hairs, segm. narrowly linear, much longer than ov., spreading; seeds distinctly trigonous.

A common weed in damp places, especially in paddy-fields, up to 5000 ft. Fl. Nov.–Feb., June; pale violet.

Also in India, Malaya, and S. China.

Apparently the commonest of the three small Lobelias in Ceylon. It is often very hairy (*L. hirta*, Wight MS. in Fl. B. Ind.), but can scarcely be considered more than a variety of *L. trigona.*

4. **L. nicotianæfolia,** *Heyne in Roth Nov. Plant.* 143 (1821).
Rasni, *S.*
L. aromatica, Moon Cat. 14. *L. excelsa*, Lesch., Thw. Enum. 170. C. P. 2592.
Fl. B. Ind. iii. 427. Wight, Ill. t. 135. Wight, Ic. t. 1172 (*L. aromatica*), and tt. 1173–4 (*L. excelsa*). Bot. Mag. t. 5587.

A very large biennial or perennial herb, stem 4–10 ft. high, erect, stout, simple or slightly branched, cylindrical, glabrous or pubescent; l. very numerous, alt., nearly sessile, the longest 12–18 in., but becoming gradually smaller upwards, the uppermost only about 3 in., and then passing into floral bracts, all linear-lanceolate, tapering at both ends, serrate, crenate-serrate, denticulate or nearly entire, usually glabrous above, glabrous or densely pubescent beneath; fl. very numerous, large, on long spreading ped., each with a leafy bract, in a dense or lax, simple or branched, erect, tapering, terminal raceme, 1–2 ft. long; cal. glabrous or pubescent, segm. long, linear, acuminate, serrate; cor. glabrous or pubescent outside, 1–1$\frac{1}{2}$ in. long, much curved, with a sharp hard point in the bud, lobes very long, linear, three usually connate throughout, and all generally remaining connected at apex; fil. connate into a tube over $\frac{1}{2}$ in., curved, dilated at base, anth. linear, obtusely pointed, glabrous or with very few hairs on back, the two lower often with a beard or brush of white bristly hairs; capsule depressed-globose, protruded above rim of adnate cal.-tube, and there opening by 2 valves; seeds very small, numerous, ovoid, smooth, and shining.

Var. β, **trichandra.** *L. trichandra*, Wight, Ic. t. 1171. Trim. in Journ. Bot. xxiii. 171.

All anth. with conspicuous white bristly hairs on the back, but none with a beard or tuft.

Open ground in the montane zone, 4000–7000 ft., and carried down to 3000 ft., or even lower, along the course of streams ; common. Fl. Dec.–April ; dull purplish-pink, or white often with pink tips. Moon's locality is 'Four Korles.'

Also in the mountains of S. India.

I cannot separate *L. excelsa*, Lesch. ex. Roxb. as a species. It is a characteristic form abundant at N. Eliya, and has the flowers very densely arranged in an unbranched spike and of a dull purplish-pink colour, and the l. densely pubescent beneath. At lower elevations the inflorescence is more lax and often branched, the flowers usually white and the l. nearly glabrous. I have never seen any flowers of the colour shown in Wight, Ill. Wight considered the Ceylon plant as a separate species, intermediate between *excelsa* and *nicotianæfolia*, both of which he also kept up as distinct. Var. *trichandra* is scarcely worth separation.

The leaves and seeds are acrid, and probably poisonous ; and the plant is often called 'wild tobacco' by the English.

Isotoma longiflora, Presl., is a W. Indian plant, not uncommonly found as a weed by roadsides. It has an acrid, poisonous milky juice.

[*Cephalostigma Schimperi*, Hochst., is given for Ceylon in Fl. B. Ind. iii. 428, but I do not know on what authority. There is no specimen from here in Herb. Kew.]

2. WAHLENBERGIA, *Schrad.*

Perennial herb, l. alt., fl. large, terminal ; cal.-tube completely adnate to ov., segm. 5 ; cor. campanulate, very deeply 5-lobed ; stam. 5, epigynous, fil. dilated, anth. distinct ; ov. inferior, 3-celled, stigma 3-lobed ; capsule erect, crowned with cal.-segm., 3-celled, dehiscent loculicidally by 3 valves on summit ; seeds small, very numerous—Sp. 80 ; 3 in *Fl. B. Ind.*

W. gracilis, *A. DC. Mon. Camp.* 142 (1830).

W. agrestis, A. DC., Thw. Enum. 169. C. P. 1774.

Fl. B. Ind. iii. 429. Wight, Ic. tt. 1175 (*W. agrestis*), and 1176 (*W. indica*).

A perennial herb, stems usually numerous, 9–18 in., slender, ascending, flexuose, glabrous or slightly hairy ; l. small, ½–1 in., sessile, linear, subacute, usually more or less coarsely hairy on both sides, the lower ones dentate-serrate ; fl. few, large, on very long slender peduncles ; cal. glabrous, segm. linear-lanceolate, acute, erect, persistent ; cor. widely campanulate, nearly 1 in. diam., lobes spreading, acute ; fil. much dilated at base, pubescent ; style thickened at top below stigma ; capsule ⅓ in., turbinate-ovoid, crowned with cal.-segm. ; seeds ovoid, slightly compressed, smooth, pale brown.

In the grass of the patanas, montane zone 4000–7000 ft., very common. Fl. Dec.–May; pale violet blue.

Throughout India and in E. Asia, Australia, N. Zealand, and S. Africa.

Campanula zeylanica, Moon Cat. 14, is probably this, which indeed strongly suggests the common Harebell (*C. rotundifolia*) of England.

3. SPHENOCLEA, *Gaertn.*

Annual, l. alt., fl. small, bracteate, in dense spikes; cal.-tube with lower half adnate to ov., segm. 5, broad; cor. small, broadly campanulate, lobes 5; stam. 5, inserted at very base of cor., distinct, included; ov. half-inferior, 2-celled, with numerous ovules, stigmas 2; capsule depressed-top-shaped, crowned with persistent cal., flat-topped, dehiscent in a circumscissile manner by a deciduous lid; seeds very numerous. —Monotypic.

S. zeylanica, *Gaertn. Fruct.* i. 113 (1788).
Moon Cat. 14. *S. Pongatium,** A. DC., Thw. Enum. 170. C. P. 1773.
Fl. B. Ind. iii. 438. Wight, Ill. t. 138 (*S. Pongatium*).

An erect annual herb, 1–2½ ft., stem somewhat stout and succulent, quite glabrous, with divaricate ascending branches; l. on short slender petioles, 1½–2½ in., oblong-lanceolate or oblong-oval, tapering to base, acute, entire, glabrous, glaucous green; fl. small, sessile, each with 3 lanceolate bracts at base, densely packed in a close, terminal, stalked spike, ½–1 in. long; cal. quite glabrous, segm. ovate, subacute; capsule chartaceous; seeds minute, ovoid, rather rough.

Wet places near the coast, rather rare. Colombo; Kalutara; Galle; Batticaloa; Jaffna. Fl. Jan., Feb.; greenish-white.

Throughout the Tropics.

Gaertner gives as the Sinhalese name of this, 'Tembul-wœnna,' and Moon 'Maha-muda-mahana.'

4. CAMPANULA, *L.*

Annual or perennial herbs, l. alt., fl. panicled or subspicate; cal.-tube adnate to ov., segm. 5; cor. (sometimes absent) campanulate, lobes 5; stam. 5, epigynous, distinct and free; ov. inferior, 3-celled, with very many ovules in each cell, stigma 3-lobed; fruit a papery capsule, dehiscent by small valves at

---

* *Pongati* is the Malabar name as given by Rheede (Hort. Malab. xi. 47).

base or on sides; seeds very numerous, minute.—Sp. 230; 13 in *Fl. B. Ind.*

Annual; fl. very small, paniculate . . . 1. C. CANESCENS.
Perennial; fl. large, spicate . . . . . 2. C. FULGENS.

1. **C. canescens,** *Wall. Cat.* 1289 (1828).
Cephalostigma spathulatum, Thw. Enum. 422. C. P. 3794.
Fl. B. Ind. iii. 439.

Annual, stem 6–18 in., erect, slender, somewhat angular, hairy, corymbosely branched at top; l. sessile, the lower spathulate, much tapering at base, the upper lanceolate or linear-lanceolate, all acute, faintly denticulate-serrate, hairy on both sides; fl. dimorphic, very small, on long bristly ped., in erect, lax, terminal panicles; cal. bristly, segm. lanceolate, acute; cor. (often absent) broadly campanulate, lobes short, ciliate; capsule very small, globose, opening by valves from the base.

Montane zone, very rare. I have only seen the C. P. specimens, collected on rocks, at 4000 ft., between Borulanda and Haputale in 1863. Fl. April; pale purple.

Also in N. and Central India and Burma.

In the fl. without a cor., the stam. also are absent.

2. **C. fulgens,** *Wall. in Roxb. Fl. Ind.* (*ed. Carey and Wall.*), ii. 99 (1824).
Thw. Enum. 169. C. P. 1775.
Fl. B. Ind. iii. 442. Wight, Ill. t. 136; Ic. t. 1179.

Perennial herb, with a short twisted rootstock and large fusiform roots, flowering stems 6–18 in., erect, glabrous, not branched; l. few, mostly near the base, on rather long petioles, oval or lanceolate, acute at both ends, crenate-serrate, nearly glabrous, upper ones sessile and narrower; fl. few, rather large, on very short ped., 1–3 together, in interrupted, terminal, spicate racemes; cal. glabrous, segm. long, linear; cor. very deeply cut (nearly to base), lobes lanceolate, acute; stam. erect, fil. dilated below; stigma-lobes linear; capsule $\frac{1}{4}$ in., ovoid, crowned with cal.-segm., dehiscent on the sides; seeds ovoid.

On patanas, upper montane zone, rather rare. Nuwara Eliya; Sita Eliya; Maturata. Fl. Feb., March, November; violet.

Also in the Himalayas and Nilgiris.

LXXIV.—VACCINIACEÆ.

SMALL tree, l. alt., without stip., fl. in racemes, regular, bisexual; cal.-tube adnate to ov., segm. 5; cor. urceolate, lobes 5, short; stam. 10, epigynous, distinct, each anth.-cell with a sharp spur at top, and also prolonged into a tube dilated at end and there opening by a large pore; ov. inferior, 5-celled, with several ovules in each, crowned by epigynous fleshy disk, stigma scarcely lobed; fruit a berry, crowned with cal.-limb, 5- (or apparently 10-) celled, seeds few, small, compressed, with endosperm.

A large Order, principally natives of cold and temperate regions. Our only species is montane.

VACCINIUM, *L.*

For characters, see Order.—Sp. 100; 17 in *Fl. B. Ind.*, but only one other of these occurs in Peninsular India.

V. Leschenaultii, *Wight, Ic.* t. 1188 (1850). **Boralu,** *S.*
Thw. Enum. 170. C. P. 270.
Fl. B. Ind. iii. 455. Wight, Ic. t. 1188; Ill. t. 139 (*V. rotundifolium*). Bedd. Fl. Sylv. t. 227.

A large shrub or small tree, much branched, bark dark grey, twigs pubescent; l. numerous, $1\frac{1}{2}$–3 in., on short stout petioles, from broadly oval to oval-lanceolate, acute at base, acuminate, finely serrate, glabrous on both sides (save when young on midrib), stiff and rather coriaceous; fl. numerous, moderate-sized, on slender somewhat nodding ped., in rather large, axillary and terminal, slightly pubescent racemes, bracts usually deciduous, often leafy and persistent; cal. glabrous or puberulous, limb very short, cup-shaped, segm. shallow, triangular, acute, ciliate; cor. tubular-urceolate, about $\frac{1}{4}$ in., lobes very short, ovate, recurved; fil. hairy, tubular prolongations of anth. unequal, 1–3 times as long as anth.; style long, simple, persistent; berry globose, about $\frac{1}{2}$ in., smooth, red; seeds ovoid, compressed, nearly smooth, pale brown.

Forests of the montane zone about 4000 ft.; rather common. Fl. Feb., March, September; bright dark pink, rarely white.

Also in the Nilgiris.

A beautiful little tree when in flower. The acid berries are edible. When the bracts of the inflorescence are leafy and persistent, it is var. *zeylanica*, Clarke in Fl. B. Ind.

A narrow-leaved variety is also distinguished by Thwaites (*Agapetes salicifolia*, Gardn. MS.).

LXXV.—ERICACEÆ.

SHRUBS or trees, l. alt., without stip, fl. regular, bisexual; cal. not adnate to ov., segm. 5; cor. urceolate or campanulate, lobes 5, stam. 10, hypogynous, distinct, anth. opening by terminal pores or slits; ov. superior, 5- or 10-celled, with many ovules in each cell, stigma lobed; fruit a capsule, 5-valved; seeds numerous, minute, with endosperm.

A large family, especially of warm temperate regions; in great abundance in S. Africa. Both our species are restricted to upper montane zone.

Cal. succulent in fruit, including the loculicidal capsule . . . . 1. GAULTHERIA.
Cal. inconspicuous; capsule woody, septifragal . 2. RHODODENDRON.

1. GAULTHERIA, *L.*

Shrub, l. alt., persistent, fl. rather small, in short dense racemes; cal. free, not adnate to ov. but becoming succulent in fruit, segm. 5; cor. urceolate-globose, lobes 5, small; stam. 10, hypogynous, distinct, anth.-cells opening by short slits at apex and produced above into 2 spurs; ov. superior, 5-lobed, 5-celled, with many ovules in each cell, stigma slightly 5-lobed; fruit a capsule, enclosed in the large succulent cal., 5-celled, opening loculicidally from apex; seeds numerous, minute, angled.—Sp. 90; 6 in *Fl. B. Ind.*

G. fragrantissima, *Wall. in As. Res.* xiii. 397 (1820). **Wel-kapuru,** *S.*

Andromeda flexuosa, Moon Cat. 35. Thw. Enum. 170. C. P. 42.
Fl. B. Ind. iii. 457. Wight, Ic. tt. 1195 (*G. Leschenaultii*) and 1196. Bot. Mag. t. 5984 (not good).

A shrub, usually small, low, and much branched, bark orange-brown, twigs pink, young parts glabrous; l. numerous, persistent, $1\frac{1}{2}$–$2\frac{1}{2}$ in., on short stout petioles, oblong-oval or oblong-lanceolate, rounded at base, obtuse, bluntly apiculate, serrate, glabrous, stiff and coriaceous, venation reticulate, conspicuous, bright green, rather glaucous, and with scattered sunk glands beneath; fl. numerous, rather small, on short drooping ped. with a pair of bractlets below the fl. and a bract at base, closely placed in dense pubescent axillary racemes much shorter than l.; cal. white, segm. acute, anth.-

spurs very sharp, reflexed; ov. pubescent; capsule small, pubescent, completely enclosed in fleshy ovoid enlarged cal. which is $\frac{1}{3}$–$\frac{1}{2}$ in. long, smooth, shining, deep purple-blue.

Var. *β*, **hirsuta,** *Gardn. in Fl. B. Ind. l. c.* C. P. 1790.

Stems covered with coarse bristly hair; l. smaller, more coriaceous, often bristly-hairy beneath.

Upper montane zone; rather common. Moon's locality is Uva. Var. *β*, Pedurutalagala; Knuckles; Wattakelle. Fl. April, May, &c.; white.

Also in the mountains of N. and S. India, Burma, and Malaya.

The fl. in the Ceylon plant are nearly scentless; the leaves have a faintly aromatic scent when bruised, whence the native name, and they afford an essential oil.

2. RHODODENDRON, *L.*

Tree, l. alt., crowded, entire, fl. large, in terminal capitulate racemes; cal. free, small, flat, persistent, segm. 5; cor. large infundibular-campanulate, lobes 5, spreading; stam. 10 (rarely less), hypogynous, distinct, anth.-cells opening by terminal pores; ov. superior, usually 10-celled, with many ovules in each cell, style simple, stigma capitate, lobed; fruit a woody capsule, dehiscent septifragally from above into 5 valves leaving the placental column; seeds very numerous, minute, winged at both ends.—Sp. 130; 44 in *Fl. B. Ind.*

Of about 38 species in the Himalaya, only this one extends into the hills of S. India and Ceylon.

R. arboreum, *Sm. Exotic Bot. t.* 6 (1804). **Ma-ratmal,** *S.*
Moon Cat. 35. Thw. Enum. 170. *R. nobile*, Wall. Cat. n. 1521 B. C. P. 149.
Fl. B. Ind. iii. 466 (var. *nilagiricum*). Wight, Ic. t. 1201, and Ill. t. 140. Bedd. Fl. Sylv. t. 228. Zenk. Pl. Ind. t. 15 (*R. nilagirica*).

A small or moderate-sized tree, with a stout usually twisted trunk and numerous thick branches, bark dark grey, deeply furrowed, twigs very stout, glabrous or nearly so, marked with large scars of fallen l. and bracts; l. 3–5 in., crowded at end of year's growth but below the fl., oblong-oval or oblong-lanceolate, tapering or slightly rounded at base, acute at apex, margin often recurved, glabrous above, more or less densely covered beneath with a thin hard felt of white or ferrugineous hair, thick and very stiff, veins impressed above, prominent beneath, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., thick, glabrous; fl. very large, on short pubescent ped., closely placed in a short terminal capitulate raceme, each with a very large rotundate

apiculate deciduous bract more or less silky-hairy on the back; cal. nearly glabrous, segm. obscure, rounded; cor. $1\frac{1}{4}$–2 in. diam., lobes broad, rounded, 2-lobed, undulate; fil. glabrous; capsule $\frac{3}{4}$ in., oblong, often tipped with persistent style, very hard and woody, glabrous, valves ultimately reflexed.

Open ground in the upper montane zone, *i.e.*, above 5000 ft.; common, generally growing gregariously. Fl. April to July; dark crimson.

Also in the Himalayas and Nilgiris.

A very conspicuous object in the hill-country, especially when in flower. On the patanas the trees, many of which must be of great age, are usually scattered, contorted, and more or less stunted in growth; but when growing together, as on Horton Plains, they attain a large size. The flowers are occasionally pale pink.

An attempt was made by Gardner to distinguish two varieties of this, according to the colour, white or rusty, of the tomentum on the under surface of the leaves. The latter is less commonly found here, and I think, usually at the lower elevations (but little above 5000 ft.); but it is the usual, if not the only, form in the Nilgiris, and is probably the plant figured as *R. Rollisonii*, Lindl., in Bot. Reg. 1843, t. 25.

This tree was recorded from the summit of Adam's Peak by the Moorish traveller Ibn Batuta in 1343-4, and is thus the earliest recorded wild plant for Ceylon: it still grows there.

LXXVI.—PLUMBAGINACEÆ.

HERBS, l. alt., without stip., fl. regular, bisexual; cal. free, tubular, segm. 5; cor. persistent, with a long tube, lobes 5, spreading, twisted in bud; stam. 5, hypogynous, distinct; ov. superior, 1-celled, with a single ovule pendulous from a basal ascending funicle, style simple, stigmas 5; fruit a capsule, included in persistent cal. and cor., circularly dehiscent near the base; seed solitary, embryo in axis of endosperm.

A small Order, generally distributed.

PLUMBAGO,* *L.*

For characters, see Order.—Sp. 10; 2 in *Fl. B. Ind.*

---

* The European species (*P. europæa*) is (or was supposed to be) the *Plumbago* of Pliny, which was a remedy for a disease of the eyes called *plumbum.*

P. zeylanica, *L. Sp. Pl.* 151 (1753). **Ela-nétul,** *S.*
Herm. Mus. 10. Burm. Thes. 195. Fl. Zeyl. n. 73. Moon Cat. 13. Thw. Enum. 244. C. P. 2265.
Fl. B. Ind. iii. 480. Wight, Ill. t. 179.

A perennial herb with long succulent roots, stems 2–5 ft., spreading, branched, cylindrical, glabrous, striate; l. $1\frac{1}{2}$–$3\frac{1}{2}$ in., sessile, oval or ovate-oval, much tapering towards base but there dilated to form rounded amplexicaul stipule-like auricles, acute at apex, entire, undulate, glabrous, thin, somewhat glaucous and finely scurfy beneath; fl. on very short ped., in erect terminal spicate racemes, rachis and bracts glandular; cal. about $\frac{1}{2}$ in., narrowly tubular, persistent, segm. with membranous margins, covered with large stalked spreading, globose, crimson glands; cor.-tube fully 1 in., slender, lobes nearly $\frac{1}{2}$ in., oval, acute; fil. as long as cor.-tube, anth. exserted just beyond throat; capsule oblong, sharply pointed, pericarp thin below, thick and hard above.

Low country, especially in the dry districts; common. Fl. Dec.–March, &c.; white.

Throughout the Tropics of the Old World.

The roots are acrid and pungent, and are largely used in native medicine, both internally and externally.

P. rosea, L., is recorded in Herm. Mus. 51 under the name 'Rat-netul,' by which it is still known. It is commonly grown in gardens as a medicinal plant, being employed chiefly as an external stimulant.

LXXVII.—PRIMULACEÆ.

HERBS, l. alt. or opp., without stip., fl. regular, bisexual; cal. free, persistent, segm. 5; cor. with a short tube, lobes 5, spreading, contorted in bud; stam. 5, inserted on base of cor., fil. very short, anth. bluntly sagittate at base; ov. superior, 1-celled, with numerous ovules on a free central placenta, style simple, persistent, stigma undivided; fruit a capsule, dehiscent by 5 valves; seeds numerous, angular or flattened, rough, embryo in copious endosperm.

An Order of temperate climates only represented here by two species of *Lysimachia* in the hills.

LYSIMACHIA, *L.*

For characters, see Order.—Sp. 60; 14 in *Fl. B. Ind.*

Stem erect; l. alt. . . . . . 1. L. RAMOSA.
Stem prostrate; l. opp. . . . . . 2. L. DELTOIDEA.

1. **L. ramosa,** *Wall. Cat.* n. 1490 (1828).
Thw. Enum. 172. C. P. 1896.
Fl. B. Ind. iii. 503.

Annual or perennial, stem erect, 2–4 ft., much branched above, glabrous, strongly 5-winged; l. alt., rather large, 3–5 in., sessile, decurrent into the wings of the stem, narrowly lanceolate, entire, glabrous, thin, rather glaucous beneath; fl. rather large, on slender slightly drooping glabrous ped. shorter than l.; cal. glabrous, segm. long-acuminate; cor. $\frac{3}{4}$ in. or more diam., lobes ovate, obtuse, spreading; capsule nearly globose, tipped by persistent style, $\frac{1}{3}$ in. diam., glabrous; seeds compressed, slightly muriculate.

Upper montane zone, above 6000 ft., in shady forests, rather common. Fl. October; bright yellow, green in the tube.

Also in the E. Himalayas, Burma, and Java, not in Peninsular India.

Our plant differs slightly from the type, and is called var. *zeylanica* in Fl. B. Ind.

2. **L. deltoidea,** *Wight, Ill.* ii. 137 (1850).
L. japonica, Thw. Enum. 172 (non Thunb.). C. P. 1895.
Fl. B. Ind. iii. 505. Wight, Ill. t. 144.

Perennial herb with prostrate, much branched, slender, woolly stems, rooting at the nodes; l. opp., on hairy petioles, $\frac{1}{2}$–1 in., broadly ovate, rounded or cordate at base, obtuse but apiculate at apex, hairy on both sides, paler and often gland-dotted beneath; fl. on very woolly ped. about as long as l.; cal. hairy, segm. lanceolate, very acute; cor. about $\frac{1}{2}$ in. diam., lobes rounded; capsule about $\frac{1}{6}$ in. diam., shorter than cal.; seeds angled, rather rough.

Upper montane zone, over 6000 ft., in shady places, rather rare. Nuwara Eliya; Maturata. Fl. April; bright yellow.

Also in the Nilgiri and Pulni Mountains.

Anagallis cærulea, Lam., occurs in a few places between N. Eliya and Badulla, but is, no doubt, an introduced weed. It is C. P. 3131.

[*Cyclamen indicum*, L. *Urulu*, Herm. Mus. 57. Fl. Zeyl. n. 401. There is no specimen of this in Hermann's Herb., but his drawing appears to represent a *Cyclamen*. If found in Ceylon, it must, of course, have been cultivated.]

LXXVIII.—MYRSINEÆ.

TREES or shrubs, sometimes climbing, l. alt., simple, without stip.; fl. regular, often polygamous; cal. free (in *Mæsa* half-adnate to ov.), persistent, segm. 5 (rarely 4); cor.-lobes (sometimes separate pet.) 5 (or 4), imbricate or contorted: stam. 5, inserted in cor.-tube opp. the lobes; ov. superior (in *Mæsa* ½–inferior), 1-celled, with few (or many) ovules on a free central placenta, style simple; fruit a berry (in *Ægiceras* a follicle); seed solitary (in *Mæsa* several), with often ruminated endosperm (absent in *Ægiceras*).

Of our twelve species all but three occur in the low moist region, and two species of *Ardisia* are confined to it; seven are found in the hill country, to which *Embelia viridiflora* and *Ardisia Missionis* are restricted; *Embelia robusta* alone is found in the dry region only, and *Ægiceras* is a plant of mangrove swamps.

Fruit a berry; seed with endosperm.
  Berry enclosed in thickened cal. . . . . . 1. MÆSA.
  Berry free, cal. not thickened.
    Cor.-lobes imbricate.
      Tree; fl. in axillary clusters . . . . 2. MYRSINE.
      Scandent; fl. in racemes or panicles . . 3. EMBELIA.
    Cor.-lobes twisted . . . . 4. ARDISIA.
Fruit a follicle; seed without endosperm . . . 5. ÆGICERAS.

1. **MÆSA,** *Forsk.*

Shrub or tree, l. alt., fl. small, in axillary panicles; cal. ½-adnate to ov., segm. 5, persistent; cor. shallowly campanulate, tube short, lobes 5, much imbricate; stam. 5, inserted at mouth of cor.-tube; ov. ½-inferior, with numerous ovules on free central placenta, style very short, stigma capitate; berry small, globose, enclosed in the thickened persistent cal.; seeds several, angular, with endosperm.—Sp. 35; 11 in *Fl. B. Ind.*

M. indica, *A. DC. in Trans. Linn. Soc.* xvii. 134 (1834). **Mata-bimbiya,** *S.*

Ribes serratum, Moon Cat. 17. Thw. Enum. 172. C. P. 1799. Fl. B. Ind. iii. 509. Wight, Ic. 1206.

A large shrub, or small much-branched tree, twigs slender, glabrous, with many lenticels, young parts glabrous; l. rather large, 3½–6 in., ovate or ovate-lanceolate, acute at base, acuminate, coarsely dentate-serrate, undulate, glabrous and shining, thin, lat.-veins conspicuous, petiole ½–1 in.; fl. very

small, with a minute bract below cal., on short ped., in lax axillary panicles usually shorter than l.; cal. glabrous, segm. oval, subacute; cor.-lobes broad, spreading; berry small, about $\frac{1}{6}$ in., globose, with truncate top, covered in by thickened cal.-segm., smooth, bluntly ribbed, pale orange-cream-coloured; seeds black.

Shady places in moist region up to 6000 ft., common, especially in montane region. Fl. Feb., March; white.

Throughout India and in Malaya and Africa.

Our plant is var. *Wightiana*, A. DC., and does not vary.

2. MYRSINE, *L.*

Bush or small tree, l. alt., crowded, fl. very small, in axillary clusters, often polygamous; cal.-segm. 5, deep; cor.-tube very short, lobes linear-lanceolate, very acute, imbricate; stam. 5, inserted on base of cor.-lobes; ov. superior, 1-celled, ovules few, on large central placenta, style short, bifid; berry globose; seed solitary, embryo axile in endosperm.—Sp. 80; 3 in *Fl. B. Ind.*

M. capitellata, *Wall. in Roxb. Fl. Ind.* (*ed. Carey and Wall.*) ii. 295 (1824).

Thw. Enum. 173. C. P. 1806.

Fl. B. Ind. iii. 512.

A bush or small much-branched tree, branchlets thick, dark brown, marked with scars of fallen l., young parts glabrous; l. closely placed, sessile, or with very short stout petioles, 3–6 in., oval or oblong-lanceolate, tapering to base, obtuse and often emarginate at apex, entire, glabrous, thick; fl. very numerous, on slender glabrous ped. varying in length and bracteate at base, in small rounded clusters, on nodules in axils of fallen l.; cal. glabrous, persistent; cor. $\frac{1}{4}$–$\frac{1}{3}$ in. diam., lobes often recurved; fil. very short, anth. large; berry $\frac{1}{3}$ in., shining, purple.

Var. β, **lanceolata,** *Clarke.* Var. *parvifolia* and var. *grandiflora*, Thw. l. c. Wight, Ic. t. 1211. Bedd. Fl. Sylv. t. 234.

C. P. 623, 2598, 3009.

L. smaller, 1–4 in., linear-lanceolate often slightly obovate; fl. rather larger.

Var. γ, **sessiliflora,** *Thw.* C. P. 285.

Fl. quite sessile.

Moist region, principally in the montane zone, throughout which it is common. Var. β, at the higher elevations. Var. γ, perhaps the commonest form. Fl. Feb.–April; pale yellowish-pink.

Throughout India, Burma, Malaya.

Extremely variable in foliage, C. P. 2598 (from Adam's Peak) is a very small-leaved form, common at the highest elevations; in such localities the l. have often recurved margins and are very coriaceous. Wight (Ic. t. 1211) is quite in error in referring Burm. Thes. t. 31, to this (see under *Memecylon umbellatum*).

Wood hard, but too small to be of use.

3. **EMBELIA,*** *Burm. f.*

Large shrubs usually climbing, l. alt., entire, glabrous; fl. very small, in axillary or terminal racemes or panicles, often polygamous; cal. small, persistent, segm. 4 or 5; cor. cut almost or quite to base into 4 or 5 lobes or distinct pet., imbricate; stam. 4 or 5, inserted on pet., fil. very short; ov. superior, 1-celled, globose, with a few ovules on the free central placenta, style simple; fruit a rather dry berry; seed solitary, deeply excavated at the base, embryo transverse, endosperm pitted on the surface.—Sp. 60; 18 in *Fl. B. Ind.*

Fl. 5-merous.
  L. oblong-lanceolate; infl. much longer than l. . 1. E. RIBES.
  L. broadly oval; infl. shorter than l. . . . 2. E. ROBUSTA.
Fl. 4-merous . . . . 3. E. VIRIDIFLORA.

1. **E. Ribes,**† *Burm. f. Fl. Ind.* 62 (1768). **Wel-embilla,** *S.*

Herm. Mus. 11. Burm. Thes. 112. Fl. Zeyl. n. 403 (*Ribesioides*). *E. paniculata*, Moon Cat. 17. Thw. Enum. 172. C. P. 1800.

Fl. B. Ind. 513. Burm. Fl. Ind. t. 23. Wight, Ic. t. 1207 (*E. glandulifera*) (not good).

A large scandent shrub, old stems with thick brown bark, set with conical mamilliform processes, climbing by means of reflexed lateral twigs which are deciduous except the basal part which remains as a woody deflexed spine, branches extremely long, very flexible, with long internodes, slender, cylindrical, bark of young branches nearly white, very smooth and shining, with large lenticels; l. 4–5 in., on very short petioles usually bordered with prominent glands, lanceolate or oblong-lanceolate, acute or rounded at base, shortly acuminate, acute or obtuse, entire, perfectly glabrous and shining on both sides, paler and somewhat silvery beneath, lat. veins invisible, whole surface with scattered, minute, red, sunken glands; fl. very small, $\frac{1}{6}$ in., numerous, on short divaricate ped., in lax, elongated, spreading, pubescent panicles 6 in.–2 ft. long, terminal or in axils of upper l., bracts small, setaceous,

---

* From the Sinhalese name, 'Æmbilla,' as given by Hermann.
† *Ribes*, from the currant-like fruit.

deciduous; cal.-segm. broad, ciliate; cor. split into 5 distinct pet., pubescent on both sides; stam. 5, erect; berry about $\frac{1}{4}$ in., nearly globose, tipped with style, smooth, crimson.

Moist region up to 4000 ft.; rather common, especially in lower montane zone. Fl. June–November; pale greenish-yellow, or nearly white.

Throughout India, S. China, and Malaya.

Hermann's specimens are good, but the plant was never named by Linnæus in his systematic books. The fruit much resembles large bunches of true currants, but when dried they look quite like black pepper, and form the bazaar drug known as 'Walinga-sal,' and much used as a vermifuge. The sunken glands are conspicuous and prominent in the young leaves, but in the adult ones can only be seen by transmitted light.

2. **E. robusta,** *Roxb. Hort. Beng.* 16 (1814).
Thw. Enum. 173. C. P. 1804.
Fl. B. Ind. iii. 513. Wight, Ic. t. 1209 (*E. Tsjeriam-cottam*).

A shrub or small tree, semi-scandent by means of its numerous horizontal branchlets, bark grey, young parts glabrous; l. 2–4 in., oval or broadly oval, acute or rounded at base, somewhat acuminate, subacute or obtuse, entire, rather undulate, thin, glabrous, paler and often reddish beneath, veins purple, the lat. ones conspicuous, petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; fl. small, on short divaricate ped., in small, axillary and terminal racemes or panicles shorter than l., bracts minute; cal. puberulous, segm. lanceolate, acute; cor. cut nearly to the base, lobes 5, recurved, puberulous on both sides; berry about $\frac{1}{6}$ in., nearly globose, apiculate, red, pulp very scanty.

Dry and intermediate region; rather rare. Kurunegala; Bintenne; Batticaloa; Ekiriankumbura. Fl. June; pale yellowish-green.

Throughout India and Burma.

3. **E. viridiflora,** *Scheff. Myrs. Arch. Ind.* 45 (1867).
Samara viridiflora*, Thw. Enum. 173. C. P. 610.
Fl. B. Ind. iii. 516. Wight, Ic. t. 1210 (*Choripetalum aurantiacum*), and t. 1591 (*Samara Rheedii*).

A large climbing shrub with many short divaricate branchlets, bark purplish-brown, with lenticels, young parts glabrous; l. 2–4 in., nearly sessile or with a very short thick petiole, oblong-oval, tapering to base, obtuse, entire, glabrous, margin often narrowly recurved, rather thick; fl. small, on short ped. in very short racemes from axils of fallen l.; cal. shallow, fleshy, segm. 4, tooth-like; cor. of 4, quite distinct,

---

* The genus *Samara*, L., was long considered to be the same as *Embelia;* but it was based wholly on Burmann, Thes. Zeyl. t. 31, which is *Memecylon umbellatum*, Burm. f. (q. v.).

oblong, obtuse pet.; stam. 4, twice as long as pet.; ov. with 3 ovules, style conical, berry $\frac{3}{8}$–$\frac{1}{2}$ in., nearly globose, tipped with stout persistent style, smooth, crimson.

Montane zone 4000–6000 ft.; rather rare. Hantane; Dimbula; Adam's Peak; Rangala; Haputale; Lagalla. Fl. April; greenish-white.
Also in S. India and Java.

4. **ARDISIA,** *Swartz.*

Shrubs, l. alt., glabrous; fl. in racemes or panicles, bisexual, buds pointed; cal. persistent, segm. 5; cor.-lobes 5, twisted in æstivation; stam. 5, inserted at base of cor.; ov. globose, 1-celled, ovules few on large central placenta, style simple; fruit a globose berry, with a solitary, large, globose seed, embryo horizontal in copious ruminated endosperm.—Sp. 200; 45 in *Fl. B. Ind.*

Inflorescence terminal, paniculate.
 L. oblong-lanceolate; panicle large . . . 1. A. MISSIONIS.
 L. oval; panicle small.
  L. thick, lat. veins oblique . . . . . 2. A. HUMILIS.
  L. thin, lat. veins horizontal . . . . 3. A. GARDNERI.
Inflorescence axillary, racemose.
 Berries red.
  Fl. large; a dwarf undershrub . . . . 4. A. MOONII.
  Fl. small; a straggling shrub . . . . 5. A. PAUCIFLORA.
 Berries dark purple . . . . . . 6. A. ELLIPTICA.

1. **A. Missionis,** *Wall. Cat. n.* 6524 (1828).
A. longifolia, Moon Cat. 16 (?) *A. paniculata*, Thw. Enum. 173 (? Roxb.). *A. courtallensis*, Thw. Enum. 423 (? Wight). DC. Prod. viii. 130. C. P. 1802.
Fl. B. Ind. iii. 519.

A shrub, 4–6 ft. high, branchlets stout, cylindrical, glabrous; l. crowded at end of the year's growth, subsessile, 5–6 in., narrowly oblong-lanceolate, tapering to both ends, subacute or obtuse at apex, faintly crenate, glabrous, rather thick, paler beneath; fl. on rather long, slender, spreading or drooping ped., panicle terminal, 6–8 in., pyramidal, with a few deciduous bracts at the base, buds sharply pointed; cal.-segm. ovate, acute; cor.-lobes very acuminate, reflexed; berry fully $\frac{1}{4}$ in., red.

Moist region, principally in the lower montane zone; common. Fl. April; pale pink.
Endemic.
A. courtallensis, Wight, Ic. t. 1215, of S. India, is scarcely distinguishable as a species; neither is *A. paniculata*, Roxb. of Assam, Khasia, &c., figured in Bot. Mag. t. 2364.

2. **A. humilis,** *Vahl, Symb. Bot.* iii. 40 (1794). **Luuu-dan,** *S.*
Herm. Mus. 43. Burm. Thes. 222. *Anguillaria zeylanica*, Gaertn. Fruct. i. 373. Moon Cat. 16. Thw. Enum. 173. C. P. 2829.
Fl. B. Ind. iii. 523 (*A. Moonii*, var. *subsessilis*). Burm. Thes. t. 103.

A shrub, stems stout, cylindrical, glabrous; l. large, 4–9 in., on short very stout petioles, oval or somewhat obovate-oval; much tapering to base, obtuse or subacute and often twisted at apex, very obscurely crenate, glabrous and shining, thick, lat. veins oblique, not conspicuous; fl. on stout, rather long, curved ped., panicle short, 2–4 in., terminal; cal.-segm. broadly oval, subacute, puberulous, cor. $\frac{5}{8}$ in. diam., lobes acute; berry large, $\frac{5}{8}$ in., bright scarlet, pulp abundant, seed-coat fibrous.

Near the south-western seacoast; rather common. Galle; Wéligama: Matara, &c. Fl. Dec.–March; bright pink.

Endemic (?).

Linnæus did not classify this, there being no specimen in Hermann's Herb.; it seems undoubtedly Vahl's *A. humilis*, which he describes as having a terminal panicle. His Ceylon specimens were from Thunberg, who in 1777 travelled along our S.W. coast where this species is found. A handsome shrub. The fruit is edible, and Burmann says that a preparation called 'Rob' was made from it, and given as a refrigerant in fevers.

3. **A. Gardneri,** *Clarke, Fl. B. Ind.* iii. 521 (1882).
A. divergens, Thw. Enum. 174 (? Roxb.). C. P. 376.
Fl. B. Ind. iii. 521.

A shrub, 3–6 ft., much branched, twigs slender, angular, often flexuose; l. $2\frac{1}{2}$–5 in., oval, tapering at both ends, subacute, entire, glabrous, rather thin, usually with numerous small, prominent wart-like glands near the margin, lat. veins numerous, horizontal, conspicuous; fl. on long slender ped., panicles usually terminal, rather small, lax, with divaricate branches, buds sharply pointed; cal.-segm. triangular-oval, subacute; cor. about $\frac{1}{2}$ in. diam., lobes acuminate, spreading or reflexed; berry about $\frac{3}{8}$ in., crimson.

Var. β, **zeylanica.** *A. zeylanica*, Clarke, l. c.

L. serrate-dentate; panicle smaller and more compact, pubescent; berry rather larger.

Forests, &c., up to 5000 ft., chiefly in the lower montane zone; rather common. Var. β, rarer. Adam's Peak; Dolosbagie; Ramboda. Fl. Dec.–April; pale pink or white.

Endemic.

Very variable, and probably rightly included by Thwaites under *A. divergens*, Roxb., of Malaya. Some of the panicles are occasionally axillary, the flowers are sometimes white, and often dotted with red glands.

4. **A. Moonii,** *Clarke in Fl. B. Ind.* iii. 523 (1882).
A. Wallichii, Thw. Enum. 174 (non DC.). C. P. 2667.
Fl. B. Ind. iii. 523 (excl. var.).

A dwarf undershrub, under 1 ft. high, with a short unbranched erect stem; l. few, crowded at top of stem, large, 4–8 in., oval, tapering to base, shortly acuminate, acute, entire, somewhat undulate, glabrous, not thick, purple and shining beneath; fl. few, on long recurved glabrous ped. thickened upwards, racemes small, narrow, on long erect peduncles from the l.-axils, the upper ones looking as if terminal, buds very pointed; cal.-segm. triangular, acute; cor. $\frac{3}{4}$ in. diam., lobes much acuminate; berry depressed-globose, pulpy, red.

Shady forests in the moist low country; rare. Kalutara (Moon); about Ratnapura; Hiniduma; Morowak Korale, abundant. Fl. Dec.–March; purplish-pink.

Endemic.

The whole plant is often suffused with purple.

5. **A. pauciflora,** *Heyne in Roxb. Fl. Ind.* (ed. Carey and Wall.) ii. 279 (1824).
Thw. Enum. 174. C. P. 15.
Fl. B. Ind. iii. 529. Wight, Ic. t. 1214.

A small shrub with slender straggling branches, young parts with rufous scaly pubescence; l. 2–6 in., narrowly lanceolate-oblong, tapering to base, acuminate, obtuse, entire but often undulate, lat. veins numerous, horizontal, obscure, petiole $\frac{1}{4}$–$\frac{1}{2}$ in., fl. small, very few, on slender ped., usually 3–5, in axillary pedunculate racemes much shorter than l., buds bluntly pointed; cal.-segm. ovate, subacute; cor. about $\frac{1}{3}$ in. diam., lobes sharply acuminate; berry scarcely $\frac{1}{4}$ in., red.

Moist and intermediate regions from 1000 ft. upwards; rather common. Fl. white.

Also in the mountains of S. India.

6. **A. elliptica,** *Thunb. Nov. Gen. Pl.* 119 (1798). **Balu-dan̥,** *S.*
A. solanacea, Moon Cat. 16 (non Roxb.). Thw. Enum. 174. *A. humilis,* Trim. Syst. Cat. Ceyl. 50 (non Vahl). C. P. 1803.
Fl. B. Ind. iii. 529 (*A. humilis*). Wight, Ill. t. 145 (*A. polycephala*).

A large much-branched shrub, branchlets stout, marked with large scars of fallen l., bark dark grey, vertically cracked; l. numerous, equally dispersed on branches, 3–4$\frac{1}{2}$ in., oblong-oval, tapering to base, obtuse at apex, entire or very faintly crenate, glabrous and polished on both sides, paler beneath, punctate with small pellucid glands, lat. veins invisible, petiole very short; fl. on rather stout ped., in numerous rather dense, corymbose, pedunculate, axillary racemes

shorter than l.; cal. pubescent, segm. large, rotundate, with a narrow membranous margin; cor. $\frac{5}{8}$ in. diam., lobes oval, acute, not acuminate; berry under $\frac{3}{8}$ in., depressed-globose, dark purple.

Low country; rather rare. Kalutara (Moon); Colombo; Galle; Batticaloa. Fl. Jan., Feb.; dull pink.

Throughout India, Malaya, and China.

This seems to be *A. elliptica*, Thunb., without much doubt, as given by Thwaites. Thunberg's brief description fits, and he gives the correct native name; he collected it on the coast road between Colombo and Matara (see his 'Florula Ceilanica,' p. 4), where it is still found.

A. solanacea, Roxb., is a common garden shrub with larger purplish fl.; not found wild in Ceylon. It is also called 'Balu-dan̥'; and is figured (as *A. humilis*) in Wight, Ic. t. 1212.

5. **ÆGICERAS,*** *Gaertn.*

Shrub or small tree, l. alt., simple, fl. in terminal umbels; cal.-persistent, segm. 5, almost distinct, twisted in æstivation; cor.-tube short, campanulate, lobes 5, reflexed, strongly twisted in bud; stam. 5, inserted in cor.-tube, anth. many-celled with transverse septa within; ov. superior, 1-celled, with many ovules on free central placenta, style simple, pointed; fruit coriaceous, follicular (or indehiscent), cylindrical, curved, very acute; seed solitary, without endosperm, embryo erect, germinating in the fruit, with a very long radicle and very short cotyledons.—Monotypic.

Æ. majus,† *Gaertn. Fruct.* i. 216 (1788). **Hin-kadol,** *S.* **Vitli-kanna,** *T.*

Moon Cat. 18. Thw. Enum. 174. C. P. 1796.
Fl. B. Ind. iii. 533. Wight, Ill. t. 146.

A small tree, 4–12 ft., much branched, bark silvery-grey, smooth, young parts glabrous; l. $1\frac{1}{2}$–3 in., on short stout petioles, oval- or obovate-oblong, tapering to base, rounded and often emarginate at apex, entire, glabrous, thick, pale green, somewhat glaucous beneath; fl. moderate-sized, numerous, on rather long slender glabrous ped., in simple, sessile, terminal or leaf-opposed umbels; cal. glabrous, segm. broad, very obtuse; cor. very thick, tube woolly within, lobes very acute, triangular, reflexed; fruit $1\frac{1}{2}$–3 in., falcately curved, very

---

* From the resemblance of the fruit to a ram's horn.

† Gaertner's *Æ. minus* is *Rourea santaloides*, W. and A. (see Pt. 2, p. 1).

sharply pointed, closely surrounded at the base by the enlarged persistent cup-like cal., glabrous, cinnamon-brown.

Seacoast, chiefly in the dry region; rather rare. Galle (Gardner); Ambalangoda; Negombo; Kalpitiya; near Mannar; Trincomalie. Fl. Jan., Feb.; white, very fragrant.

All Tropical shores.

This is considered one of the 'Mangroves,' the seeds germinating before falling, and Linnæus called it *Rhizophora corniculata;* the anthers are also like those of the Rhizophoreæ. In the seed the small cotyledons are concealed by a hood, which is formed by a prolongation of the placenta.

LXXIX.—SAPOTACEÆ.

TREES, rarely shrubs, l. alt., entire, without stip.; fl. small, regular, bisexual, axillary; cal.-segm. deep, 4–8, imbricate or in two rows with the outer valvate, persistent; cor.-lobes 4–6 or 12 imbricate or twisted, or 18 or 24 in 2 or 3 series; stam. 5, 6, 8, or 12, as many as the cor.-lobes and opp. them or twice as many; staminodes when present as many as and alt. with stam.; ov. superior, 4–8-celled, ovules solitary in each cell, style simple, tapering; fruit a berry; seeds 1–8, large, ovoid, somewhat compressed, with a shining testa and a long conspicuous hilum, with or without endosperm.

An Order characteristic of the moist low country, where 15 out of our 17 species occur. Only 3 are found in the dry region, but 2 of them, *Mimusops hexandra* and *Sideroxylon tomentosum*, there only. *Isonandra* and 2 species of *Palaquium* extend into the montane zone. All contain a milky juice, which, after evaporation of its liquid portion, affords that variety of Caoutchouc known as Gutta-percha. All the species of *Palaquium* and 4 of *Bassia* are endemic.

Cal.-segm. 5, imbricate; stam. 5.
  Staminodes o . . . . 1. CHRYSOPHYLLUM.
  Staminodes 5 . . . . 2. SIDEROXYLON.
Cal.-segm. 4, 6, or 8, in two series.
  Cal.-segm. 4; staminodes o.
    Stam. 8 . . . . 3. ISONANDRA.
    Stam. 12. . . . . 4. BASSIA.
  Cal.-segm. 6 or 8.
    Stam. 12, staminodes o . . . . . 5. PALAQUIUM.
    Stam. 6 or 8, staminodes 6 or 8 . . . . 6. MIMUSOPS.

1. **CHRYSOPHYLLUM,** *L.*

Tree, l. alt., entire, fl. small, in axillary clusters; cal.-segm. 5, large, much imbricated; cor.-lobes 5, imbricate; stam. 5,

inserted at base of cor.-lobes; no staminodes; ov. 5- (or 6-) celled, style simple, pointed; fruit a solid fleshy berry; seeds 5 (or 6), large, compressed, with a linear hilum down one side, with endosperm.—Sp. 60; 1 in *Fl. B. Ind.* (mostly American).

C. Roxburghii, *G. Don, Gen. Syst.* iv. 33 (1838). **Lawulu,** *S.*
Thw. Enum. 174. C. P. 2689.
Fl. B. Ind. iii. 535. Bedd. Fl. Sylv. t. 236.

A rather slender erect tree of moderate size, branches horizontal, bark smooth, grey, young parts with dense fulvous pubescence; l. numerous, spreading distichously, 3–7 in., shortly petiolate, lanceolate-oblong, acute and somewhat unequal-sided at base, suddenly caudate-acuminate, obtuse, somewhat undulate, glabrous and shining on both sides when mature, or with a few hairs on midrib beneath, lat. veins very numerous, conspicuous, fine, horizontal, parallel, uniting with an intramarginal one; fl. small, on slender, glabrous or rusty-pubescent ped., rather numerous, in rounded clusters; cal. glabrous, segm. rounded, very obtuse, rather unequal; cor. broadly campanulate, lobes short, rounded, woolly-ciliate; stam. short, included; berry about $1\frac{1}{2}$ in., ovoid-globose, very obscurely 5-sided, ferrugineous-tomentose when young, afterwards smooth, yellowish-green; seeds about $\frac{3}{4}$ in., ovoid, somewhat compressed, the inner edge straight, the outer curved, brownish-yellow, highly polished, very hard.

Moist region up to 3000 ft.; rather common. Fl. Sept.; greenish-white.

Also in S. India, Assam, Burma, and Malaya.

The Ceylon tree agrees with *C. sumatranum*, Miq., of Sumatra, considered merely a variety of *C. Roxburghii* by most authors. The leaves are veined like a *Calophyllum*.

Wood yellowish-white, even-grained, light. The berries are eaten by natives, but have a very viscous pulp.

2. SIDEROXYLON, *L.*

Small tree, twigs often spinous, l. alt., entire; fl. in axillary clusters; cal.-segm. 5, strongly imbricate; cor.-tube campanulate, lobes 5, imbricate, stam. 5, alternating with 5 flat lanceolate staminodes; ov. 5-celled, style very long, simple, persistent; berry globose, apiculate, smooth; seed usually solitary (others abortive), broadly ovoid, slightly compressed, hilum linear-oblong, with endosperm.—Sp. 60; 7 in *Fl. B. Ind.*

S. tomentosum, *Roxb. Cor. Pl.* i. 28 (1795). **Mul-makil,** *T.*
Sapota elengoides, A. DC., Thw. Enum. 175. C. P. 1795.
Fl. B. Ind. iii. 538. Wight, Ic. t. 1218 (*S. elengoides*). Bedd. Fl. Sylv. t. 235 (*Achras elengoides*).

A small much-branched tree, bark much cracked, the lat. twigs often becoming sharp axillary spines, young parts rusty-pubescent; l. numerous, 2–2½ in., on short pubescent petioles, oval or obovate-oval, acute at base, subacute, glabrous when mature, stiff, paler beneath, with the lat. veins conspicuous (but not prominent), fine, anastomosing; fl. small, on short, stout, pubescent ped., in small, rounded, axillary clusters; cal. tomentose, segm. lanceolate, acute, speading at ends; cor.-lobes narrowly lanceolate, very acute; stam. very short, staminodes lanceolate, hairy; ov. densely hairy, style much exserted; berry ¾–1 in., pubescent when young, afterwards glabrous, green; seed ½ in., shining, brown.

Dry and intermediate regions to 2000 ft.; rather rare. Maturata; Nalande; Mulliativu. Fl. Sept.; white.

Also in S. India and Burma. A montane plant in S. India on the higher Nilgiris, &c., but not in our Hills.

Wood hard, heavy, yellowish. Berries said to be eaten.

3. ISONANDRA, *Wight.*

Tree, l. alt., entire; fl. small, sessile in axillary fascicles; cal.-segm. 4, imbricate; cor.-lobes 4, imbricate; stam. 8, inserted on cor.-tube; ov. 4-celled, style simple; berry ovoid-oblong, pointed; seed solitary, long-ovoid, slightly compressed, embryo large, with flat cotyledons in scanty fleshy endosperm. —Sp. 7; 6 in *Fl. B. Ind.*

I. lanceolata, *Wight, Ic.* ii. 1, 5 (1843). **Kiriwarala, Mol-pedda,** *S.*
I. Wightiana, A. DC., Thw. Enum. 177. C. P. 45.
Fl. B. Ind. iii. 539 (with *I. Wightiana*). Wight, Ic. t. 359, and t. 1219 (*I. Perrottetiana*), and t. 1220 (*I. Candolleana*).

A moderate-sized or large tree, much branched, bark dark brown, young parts rusty-pubescent, l. shortly petiolate, very variable, usually 1½–3½ in., oval or oblong-oval or obovate-oval, tapering to base, sometimes acuminate, rounded, or obtuse, often rather undulate, glabrous, stiff, paler beneath, lat. veins distant, conspicuous, curved, connected by parallel veinlets; fl. small, sessile or very nearly so, in small, crowded, axillary fascicles; cal. rusty-silky, segm. lanceolate, subacute; cor. glabrous, lobes short, rounded; stam. short, included;

style exserted; berry over $\frac{3}{4}$ in., cylindrical, often narrowed at base, smooth, soft, brilliant scarlet; seed over $\frac{1}{2}$ in., hard and highly polished, bright brown.

Var. β, **angustata,** *Thw. l. c.* C. P. 179.

L. linear-lanceolate, gradually narrowed from below the middle to apex.

Var. γ, **montana,** *Thw. l. c.* C. P. 3092.

L. obovate, very obtuse, coriaceous, smaller venation not parallel.

Var. δ, **compta,** *Thw. in Fl. B. Ind.* iii. 540. C. P. 3912.

L. oval, densely covered beneath with fine fulvous hair, smaller venation not parallel.

Var. ε, **major,** *Clarke, l. c.* C. P. 45 (part).

L. linear-oblong, 6–9 in., very acuminate.

Moist region, 1000–6000 ft.; common in the lower montane zone, rarer below it. Var. γ, Nuwara Eliya; Hantane. Var. δ, Adam's Peak. Var. ε, Hiniduma. Fl. Jan.–April; pale yellow.

Also in the Hills of S. India.

I cannot see how to separate *I. Wightiana*, A. DC., from this. The plant is extremely variable in foliage, but not otherwise. Wood hard and heavy.

4. **BASSIA,** *Kœnig, ex Linn.*

Trees, l. alt., with usually caducous stip., fl. in small axillary clusters; cal. cut nearly to base into 4 segm., in two pairs, outer pair enclosing inner, persistent; cor.-tube campanulate, lobes 6–12 (usually 6), twisted; stam. twice as many as cor.-lobes, usually 12, inserted on cor.-tube in one or two tiers, anth. acute, usually mucronate; ov. 6- (rarely 8-) celled, style simple, long; fruit ovoid, usually pointed; seed solitary, cotyledons large, hemi-cylindric, fleshy, no endosperm.—Sp. 30; 13 in *Fl. B. Ind.*

All the species but *B. longifolia* are endemic.

Cor.-lobes 8–12; stam. in two tiers . . . 1. B. LONGIFOLIA.
Cor.-lobes 6 (very rarely 5); stam. in one tier (*Dasyaulus*)
  Mature leaves glabrous.
    L. over 3 in. long.
      L. oval; buds rusty-pubescent . . . 2. B. MOONII.
      L. oblong-linear; buds glabrous . . . 3. B. NERIIFOLIA.
    L. under 3 in. long . . . . 4. B. MICROPHYLLA.
  Mature leaves hairy on veins beneath . . 5. B. FULVA.

1. **B. longifolia,** *L. Mant.* 563* (1771). **Mi,** *S.* **Iluppai,** *T.* Gaertn. Fruct. ii. 104. Moon Cat. 36. Thw. Enum. 175. C. P. 1797. Fl. B. Ind. iii. 544. Wight, Ill. t. 147. Bedd. Fl. Sylv. t. 42.

A very large tree, much branched, bark thick, dark yellowish-grey, slightly furrowed, young parts pinkish-white, silky pubescent; l. crowded at end of year's growth, on slender petioles about $\frac{1}{2}$ in. long, $3\frac{1}{2}$–$4\frac{1}{2}$ in., linear-lanceolate, tapering to both ends, slightly acuminate, quite glabrous when mature, thin, venation pellucid, stip. linear, very early deciduous; fl. appearing with the young l., and below them, solitary in axils of small deciduous bracts, ped. 2–$2\frac{1}{2}$ in., slender, rather thickened in upper part, glabrous, erect, afterwards drooping; cal. $\frac{3}{8}$ in., segm. ovate, acuminate, deciduous in fruit, outer pair nearly glabrous, inner finely tomentose; cor. fleshy, tube inflated, lobes 8–12, about as long as tube, oblong, obtuse, erose, erect; anth. 16–24 in 2 tiers, upper tier quite sessile, lower with very short fil., cordate at base, apiculate, 3-toothed at apex, hairy; ov. 8-celled, hairy, style very long, much exserted; fl. 2 in., obliquely ovoid, pointed, glabrous (tomentose when young); seed solitary (rarely 2), $1\frac{1}{2}$–$1\frac{3}{4}$ in., ovoid, slightly compressed, straight on one edge, curved on the other, with a short curved beak, hilum linear, extending the whole length of straight edge, testa thin, hard, brittle, shining, ochre-yellow.

Forests of the dry region, common; in the moist low country much rarer and usually (? always) planted. Fl. Feb., May; pale yellow.

Also in S. India.

Deciduous and bare for a few days in the dry season, and quickly covered with the yellowish-pink young leaves. The fleshy flowers are very sweet, and are dried and eaten; the scent when in blossom is strong and unpleasant. Bark used as an astringent tonic. The seeds afford an oil ('mi-tel') much used locally for cooking, and as an application in cutaneous diseases. The oil-cake, after expression of the oil, is called 'arappo,' and exported from Jaffna to the Malabar coast in some quantity. Attains a great size, 18 ft. or more in girth. The timber is pale reddish-brown, heavy, strong, and very durable, lasting well under water. Gaertner (Fruct. t. 104, f. 2) figures the fruit as 5-celled, 5-seeded.

[*B. latifolia*, Roxb., the 'Mahwa' tree of Central India, has several times been recorded for Ceylon, but no doubt *B. longifolia* was intended.]

2. **B. Moonii,** *Bedd. Fl. Sylv. For. Man.* 140 (1873 ?).
Dasyaulus Moonii, Thw. Enum. 176. C. P. 3434.
Fl. B. Ind. iii. 545.

Tree, bark dark greyish-brown, young twigs rusty-pubes-

* Kœnig MSS. are also here quoted by Linnæus to the effect that this is the Illipe tree of the Tamils, 'Illipe malabarorum.' This has been recently published by Engler (Pflanzenfam., vi. 133) as if a generic and specific appellation, to which it has no sort of claim.

cent; l. scattered, $3\frac{1}{2}$–4 in., on petioles under $\frac{1}{2}$ in. long, oval, acute at base, obtuse or retuse at apex, quite glabrous, rather thin, veins very fine; fl. on glabrous ped. $\frac{1}{2}$ in. long, 2–5 in cluster; cal. $\frac{1}{4}$ in., segm. ovate, acute, inner ones silky-pubescent; cor. large, pubescent inside and out, lobes 6, oblong, obtuse; stam. 12, connective sharply aristate; style exserted; fruit not seen, '$1\frac{1}{2}$ in., oblong, acute.'

Moist low country; very rare. Kalutara (Moon); near Ratnapura (Thwaites).

Endemic.

I have seen only a single specimen (Moon's).

3. **B. neriifolia,** *Moon Cat.* 36 (1824). **Gan-mi,** *S.* [PLATE LIX.]

Dasyaulus neriifolius, Thw. Enum. 175. *Illipe neriifolia*, Engl. l. c. C. P. 235.

Fl. B. Ind. iii. 545. Bedd. Fl. Sylv. t. 254 (flower only).

A moderate-sized or small tree, bark dark brown, twigs furrowed, young parts glabrous; l. numerous, scattered, on very short petioles $\frac{1}{4}$ in. long, 4–7 in., oblong-linear, tapering to base, obtuse, often apiculate, glabrous, rather thin, venation pellucid, stip. filiform, brown, persistent; fl. in clusters of about 6 from l.-axils, ped. about 1 in., erect or deflexed, glabrous; cal. over $\frac{1}{4}$ in., segm. oval-lanceolate, acute, inner ones silky-hairy; cor.-lobes 6, oblong, obtuse, silky outside; anth. 12, in one tier, sessile, very acute; style much exserted, persistent; fruit 1–$1\frac{1}{2}$ in., linear-ovoid, beaked; seed solitary, over 1 in., linear-ovoid, compressed, acute at both ends, shining, pale brown, hilum whole length of one side.

Moist low country, by streams; common. Moon's locality is Kalutara. Fl. Feb. and March.

Endemic.

Wood as in *B. longifolia.*

4. **B. microphylla,** *Hook, Ic. Pl.* i. t. 74 (1837).

Dasyaulus microphyllus, Thw. Enum. 175. *B. parvifolia*, A. DC. Prod. viii. 198. C. P. 2648, 2830.

Fl. B. Ind. iii. 545. Hook. Ic. Pl. i. t. 74.

Tree, much branched, buds fulvous-hairy; l. small, numerous, on short petioles, $1\frac{1}{2}$–3 in., lanceolate-oblong, acute at base, rounded at apex, quite glabrous, stiff, not thick, venation inconspicuous; fl. small, 2–4 from l.-axils, ped. about $\frac{1}{2}$ in., glabrous; cal. scarcely $\frac{1}{4}$ in., segm. ovate, subacute, inner ones silky; cor.-tube hairy within, lobes 6 (rarely 5), ovate, obtuse, slightly exceeding cal.; stam. 12; fruit not seen.

Forests of moist low country; rather rare. Colombo; Negombo; Galle; Pasdun Korale. Fl. March–April, September; brownish-white.
Endemic.
Varies much in size of leaves. The wood of this also seems to be called 'Wana-Mi' in S. Prov.

5. **B. fulva,** *Bedd. Fl. Sylv. For. Man.* 140 (1873?) **Wana-mi,** *S.* *Dasyaulus fulvus*, Thw. Enum. 176. *Illipe fulva*, Engl. l. c. C. P. 3446.
Fl. B. Ind. iii. 545.

A moderate-sized tree, bark brownish-grey, young shoots densely covered with copious orange tomentum; l. few, on stout, densely tomentose petioles about ¾ in. long, broadly oval or oblong-oval, acute or subacute at base, shortly acuminate, glabrous above when mature and fulvous-hairy on the veins beneath (when young densely covered on both sides with orange-fulvous tomentum), rather thick, venation prominent beneath, depressed above; fl. numerous, in clusters of 4–8 from tomentose prominent bosses in axils of fallen l. ped. 1½ in., glabrous; cal. nearly ½ in., outer segm. oval acute, glabrous, recurved, inner obtuse, densely fulvous-tomentose, erect; cor. not seen; fruit (immature) 1½ in. ovoid, pointed, glabrous.

Moist low country below 1000 ft.; rare. Hewesse; Eknaligoda, Fl. April, August.
Endemic.
Wood very hard and heavy, yellowish-brown.

5. PALAQUIUM, *Blanco* (1837).

Trees, l. alt., entire, fl. small in axillary fascicles; cal. deeply cut into 6 segm., in 2 series, the outer valvate, the inner imbricate; cor.-lobes 6, imbricate; stam. 12, inserted in one row on cor.-tube, anth. acute, sometimes 2-horned; staminodes 0; ov. 6-celled, style long, simple; fruit globose or ovoid, fleshy; seed solitary, without endosperm.—Sp. over 30; 15 in *Fl. B. Ind.*

Our species are apparently ill-defined, but I have had little opportunity of examining them in a living state. All are endemic, and inhabit the wet forests of the low moist region. They yield a milky juice (Gutta-percha), but none is collected from Ceylon species. (The best sort is obtained from *P. Gutta*, Burck, of the Malay Peninsula, figured in Bentl. and Trim. Med. Pl. t. 167).

Pedicels $\frac{1}{4}$–$1\frac{1}{4}$ in.	
Fil. of stam. alternately longer and shorter; anth. horned (*Dichopsis*)	1. P. PETIOLARE.
Fil. of stam. equal in length; anth. not horned.	
L. crowded at ends of twigs.	
L. oval, lat.-veins conspicuous. . .	2. P. GRANDE.
L. obovate-oval, lat.-veins obscure . .	3. P. RUBIGINOSUM.
L. evenly scattered.	
L. rounded at base, midrib deeply channelled above	4. P. CANALICULATUM.
L. acute at base.	
Young parts fulvous-pubescent . .	5. P. THWAITESII.
Young parts glabrous	6. P. LÆVIFOLIUM.
Flowers nearly sessile	7. P. PAUCIFLORUM.

1. **P. petiolare,** *Engl. Pflanzenfam.* iv. 1, 135 (1890).

Dichopsis petiolaris, Thw. Enum. 176; Trim. Syst. Cat. 51. *Bassia petiolaris*, Bedd. For. Man. 140. C. P. 3012.

Fl. B. Ind. iii. 540 (*Dichopsis*). Bedd. Fl. Sylv. t. 254 (fl. and fruit).

A large tree, bark smooth, grey, buds pubescent; l. 3–5 in., on petiole 1–$1\frac{1}{4}$ in. long, oval or oblong-oval, tapering to base, shortly acuminate, obtuse, glabrous above, lat. veins distant, parallel; fl. 2–5 together, from axils of recently fallen l., ped. $\frac{1}{2}$–1 in., thickened at top, finely rufous-pubescent, becoming thickened and woody with fruit, spreading, cal. $\frac{1}{3}$ in., rufous-pubescent, segm. triangular, subacute, enlarged and woody with fruit; cor.-tube pilose within, lobes lanceolate, obtuse; stam. with unequal fil., those alt. with cor.-lobes very short, anth. bluntly 2-horned; fruit nearly globose, about $1\frac{1}{4}$ in., apiculate, supported by woody enlarged sep., glabrous, 1-seeded.

Moist low country below 2000 ft.; rather rare. Hiniduma; Reigam Korale; Matugama, Pasdun Korale; Ambagamuwa. Fl. Dec.–March; pale greenish-pink.

Endemic.

This is the original and only species of Thwaites' genus *Dichopsis*, distinguished by its stamens; the others here included in *Palaquium* he referred to *Isonandra*.

2. **P. grande,** *Engler, l. c.* (1890). **Kirihiriya, Mihiriya, Kirihembiliya,** *S.*

Isonandra grandis, Thw. Enum. 176. *Dichopsis grandis*, Trim. Syst. Cat. 51. C. P. 619.

Fl. B. Ind. iii. 540 (*Dichopsis*). Bedd. Fl. Sylv. t. 254 (*Bassia grandis*).

A large tree, much branched; bark thick, brown; twigs with prominent scars of fallen l. and inflor.; l. crowded at end of annual growth, large, 4–10 in., oval, tapering into petiole, very shortly acuminate, rounded or rarely acute at apex, glabrous on both sides or minutely pubescent beneath, lat. veins parallel, conspicuous, petiole $\frac{3}{4}$ in., very stout, flat on

top; fl. 2–5 or more together, from closely placed woody bosses in axils of fallen l., ped. ¼–¾ in., thickened above, densely rufous-pubescent; cal. rufous-pubescent, segm. very deep, ovate-lanceolate, acute; cor. nearly twice as long as cal., tube hairy within, lobes oblong, obtuse; fil. nearly equal in length; fruit over 1¼ in., nearly globose, on a much thickened stalk which is swollen upwards, strongly apiculate, smooth, purple; seeds six, over 1 in. long, oblong-ovoid, brown, shining.

Var. β, **parvifolium,** *Clarke, l. c.* C. P. 2402 (part).

L. smaller, 2–4 in., usually obovate and with a rusty-orange or pink pubescence beneath; fruit more ovoid.

Var. γ, **angustatum,** *Trim. Syst. Cat. Ceyl. Pl.* 51. C. P. 2402 (part).

L. smaller, 1½–2½ in., narrowly obovate or oblong-lanceolate, slightly spathulate, rounded at apex, lat. veins not distinct from general reticulate venation; cal.-segm. linear-lanceolate, very acute.

Moist region in forests, especially from 3000–5000 ft.; rather common. Var. β from 4000–6000 ft.; var. γ in the N.E. mountain block, rather rare. Matale East; Kalupahana; Lagalla; Uma-oya (?). Fl. March–May and Sept.–Nov.; pale yellow.

Endemic.

An extremely variable tree in size of leaves and character of pubescence beneath. The latter is often bright rusty-orange, or pink or purplish, or absent altogether. I have another form collected in forest at Porey, near Colombo, by Ferguson (also included by Thwaites under C. P. 2402), which may be a distinct species, but the material is not sufficient to decide; the flowers (buds) are on very short pedicels, and the leaves small and rufous-silky beneath.

From the S. name given, this seems to be the *Bassia latifolia* of Moon Cat. Additions.

Wood rather heavy, yellowish-brown. The oil from the seeds is used with food.

3. **P. rubiginosum,** *Engler, l. c.* (1890).
Isonandra rubiginosa, Thw. Enum. 177. *Dichopsis rubiginosa*, Trim. Syst. Cat. 51. C. P. 3447, 394.
Fl. B. Ind. iii. 541 (*Dichopsis*).

A large tree with spreading branches, branchlets very stout, marked with scars of l. and inflor., bark dark brown; l. crowded at summit of branchlets, on very short finely pubescent petioles ½–¾ in. long, obovate-oval, tapering to base, usually obtuse or rounded (rarely acute) at apex, glabrous and dark green above, densely clothed with fine orange-red pubescence beneath, thick and leathery, lat. veins rather obscure; fl. on stout, drooping or deflexed pubescent ped. ½–¾ in. long, 2–7 together in axils of lower l.; cal. about ½ in.,

rufous-pubescent, segm. lanceolate, very acute; cor.-tube short, lobes oblong, acute, slightly exceeding cal.; anth. sharply pointed; style much exserted; fruit (not ripe) 1 in., ovoid, apiculate.

Moist region up to 4000 ft.; rare. Hiniduma; foot of Adam's Peak; Maskeliya; Hunasgiria; Lagalla Hill. Fl. March, April; whitish.

Endemic.

A very large tree with beautiful foliage. The low-country specimens have smaller leaves with somewhat different venation. I have had the S. name 'Kiri-nuga' given me for this.

4. **P. canaliculatum,** *Engler, l. c.* (1890).

Isonandra canaliculata, Thw. Enum. 177. *Dichopsis canaliculata*, Trim. Syst.Cat. 51. C. P. 3473.

Fl. B. Ind. iii. 541 (*Dichopsis*).

A moderate-sized tree, bark reddish-grey, l. scattered, large, 4–10 in., on stout petioles 1–1½ in. long and narrowly channelled on upper surface, oblong-oval, rounded or subacute at base, more or less acuminate, acute or obtuse, glabrous on both sides, rather thick, deeply channelled along midrib on upper surface; fl. on rather slender densely pubescent ascending ped. ¾–1¼ in. long, 1–6 together in axils of past and present l.; cal. rufous-pubescent, segm. triangular-ovate, acute; fruit (not ripe) ½ in., ovoid.

Moist low country below 1000 ft.; very rare. Kalutara; Singhe Raja Forest. Fl. Jan., June, September; white.

Endemic.

5. **P. Thwaitesii,** *Trim.*

Isonandra lanceolata, Thw. Enum. 442 (non Wight). *Dichopsis lanceolata*, Trim. Syst. Cat. 51. *P. lanceolatum*, Engl. l. c. (non Blanco). C. P. 3679.

Fl. B. Ind. iii. 541 (*Dichopsis lanceolata*).

A medium-sized tree, young parts rusty-pilose; l. scattered, 3–4½ in., oblong-lanceolate, tapering to base, very bluntly acuminate, glabrous on both sides when mature, when young fulvous-pubescent beneath, rather thick, lat. veins inconspicuous, petiole ¾ in., thickened at base; fl. solitary or 2 or 3 together, ped. about ½ in., rufous-pilose; cal. minutely pilose, about ½ in., segm. triangular, acute; fruit not seen.

Moist low country below 1000 ft.; very rare. I have seen only the C. P. specimens which were collected near Kalutara, and some (doubtful) leaves from Hiniduma.

Endemic.

6. **P. lævifolium,** *Engler, l. c.* (1890).

Isonandra lævifolia, Thw. Enum. 177. *Dichopsis lævifolia*, Trim. Syst. Cat. 51. C. P. 2832.

Fl. B. Ind. iii. 541 (*Dichopsis*).

A moderate-sized much-branched tree, bark rather smooth,

grey; young parts glabrous; l. numerous, evenly scattered, rather small, 3–4 in., on stout petioles $\frac{1}{4}$ in. long, oblong-lanceolate, tapering to base, obtuse, glabrous and shining on both sides, rather thin; fl. few, small, ped. about $\frac{1}{4}$ in., slightly pubescent, 2 or 4 together; cal. $\frac{1}{8}$ in., pubescent, segm. oval, obtuse, cor. exceeding cal., lobes oval, obtuse; style not exserted; fruit (ripe?) about 1 in., fusiform-oblong, sharply pointed.

Moist low country below 2000 ft.; rather rare. Karawita Kande; Reigam Korale; Kalawane, Sabaragamuwa. Fl. March–May; brownish-white.

Endemic.

7. **P. pauciflorum,** *Engler, l. c.* (1890).
Isonandra pauciflora, Thw. Enum. 177. *Dichopsis pauciflora*, Trim. Syst. Cat. 51. C. P. 2680.
Fl. B. Ind. iii. 541 (*Dichopsis*).

A moderate-sized tree, bark brown, buds rufous-hairy; l. large, 5–9 in., lanceolate, tapering to base, suddenly acuminate, obtuse, glabrous on both sides, rather thin, lat. veins horizontal, connected by arches within the margin, deeply channelled along midrib above, petiole $\frac{3}{4}$–1 in., channelled above; fl. few, nearly sessile, 1–3 together; cal. under $\frac{1}{4}$ in., rusty-pubescent, segm. ovate, subacute; cor. exceeding cal., lobes oblong, obtuse; fruit (immature) ovoid, apiculate.

Moist low country below 1000 ft.; rare. About Ratnapura; near Opatte, S. Prov. Fl. March; greenish-white.

Endemic.

6. **MIMUSOPS,*** *L.*

Large trees, l. alt., without stip., fl. small, in axillary clusters; cal.-segm. 6 or 8 in two series, outer valvate enclosing the inner; cor.-tube short, lobes 18 or 24 in two or three series; stam. 6 or 8 inserted at base of cor.-tube; staminodes 6 or 8, alternating with stam.; ov. 6- or 8-celled, style simple, exserted; fruit a fleshy berry; seed usually solitary, ovoid, compressed, embryo with large flat cotyledons, in fleshy endosperm.—Sp. 30; 3 in *Fl. B. Ind.*

The large number of cor.-lobes may be readily explained by considering each true pet. (alt. with cal.-segm.) to be provided with large lat. stipules.

Cal.-segm. and stam. 8; cor.-lobes 24 . . . 1. M. Elengi.
Cal.-segm. and stam. 6; cor.-lobes 18 . . . 2. M. hexandra.

---

* *Mimusops* is equivalent to the Sinhalese Muna-mal (= face-flower), the application of which is not obvious.

1. **M. Elengi,*** *L. Sp. Pl.* 349 (1753). **Muna-mal,** *S.* **Makil, Mukalai, Vilva-pattiri,** *T.*

Herm. Mus. 23, 39. Burm. Thes. 27. Fl. Zeyl. n. 138. Moon Cat. 31. Thw. Enum. 175. C. P. 1794.

Fl. B. Ind. iii. 548 (not given for Ceylon). Gaertn. Fruct. t. 42 (fruit). Wight, Ic. t. 1586. Bedd. Fl. Sylv. t. 40.

A large tree with erect trunk and compact leafy head, bark reddish-brown, branchlets drooping, young parts silky with fine, adpressed hair, l. numerous, distant, on slender cylindrical petioles 1 in. long, large, $4\frac{1}{2}$–6 in., oval, subacute at base, acuminate, obtuse at apex, undulate, glabrous, dark green and polished above, paler beneath, rather thick, lat. veins very numerous and slender, stip. minute, lanceolate, quickly falling, fl. in fascicles of 1–4 in l.-axils, ped. $\frac{1}{4}$–$\frac{1}{3}$ in., adpressed-pubescent, often deflexed; cal.-segm. 8, lanceolate, subacute, outer ones pubescent; cor.-tube short, fleshy, lobes 24 in three series of 8 each, linear-oblong, acute, often slightly lacerate; stam. 8, anth. nearly sessile, sharply acuminate, cells divergent at base; staminodes 8 alternate with stam., oval, acuminate, hairy on outside; ov. silky-pubescent; fruit rather over 1 in., ovate-ovoid or ovoid, apiculate, pubescent when young, afterwards glabrous, orange-yellow; seed solitary, under 1 in., ovoid, compressed, brown, shining.

Low country; rather common, often cultivated. Fl. March; white, becoming cream-coloured.

Also in Indian and Malayan Peninsulas.

The flowers are very sweet-scented, and retain their odour when dry; the natives prepare a scent from them. Timber used for building, the wood is even-grained, hard, and heavy, pinkish-red, and looking like raw beef when fresh cut, afterwards pale reddish-brown. The bark is bitter, used in medicine and in the manufacture of arrack, and the fruit edible.

2. **M. hexandra,** *Roxb. Cor. Pl.* i. 16 (1795). **Palu,** *S.* **Palai,** *T.*

Moon Cat. 31. *M. indica*, A. DC., Thw. Enum. 175. C. P. 1793.

Fl. B. Ind. iii. 549. Wight, Ic. t. 1587.

A very large tree with a tall stout unbranched trunk, and few thick spreading primary branches, bark blackish-grey, deeply furrowed vertically, young parts glabrous; l. numerous, rather small, $1\frac{1}{2}$–3 in., broadly obovate, acute at base, truncate emarginate or bilobed at apex, glabrous, subcoriaceous, venation pellucid, inconspicuous, petiole $\frac{3}{8}$ in., channelled above; fl. small, numerous, on slender curved rusty ped. about $\frac{3}{8}$ in. long, 1–3 in l. axils; cal. about $\frac{1}{4}$ in., segm. 6, lanceolate, subacute, puberulous; cor.-lobes 18, 6 longer than the rest, linear-lanceolate, acuminate; stam. 6, fil. as long as anth., anth. not

---

* *Elengi* is the name given in Rheede, Hort. Malab. for this tree.

acuminate, acute; staminodes 6, alt. with stam., deeply laciniate, glabrous; ov. 12-celled; fruit small, a little over ½ in., ovoid, smooth, red; seed solitary (rarely 2) about ½ in., ovoid, reddish-brown, shining.

Forests of the dry region; very common. Fl. Feb., March; pale yellow.

Also in Peninsular India.

A valuable timber tree; the wood very hard, heavy, and tough, purplish-brown, capable of high polish. Has been employed for railway sleepers. The fruit, which is ripe in July, affords food to a large number of people, and is collected and dried either separately or in cakes, and exported from Jaffna to S. India.

The buds are liable to be transformed into small prickly ovoid bodies (galls?) simulating a fruit. Young trees have often short, suppressed, conical, semi-spinous branchlets on the main stem, with crowded fascicu-late leaves.

M. Kauki, L., a native of Malaya, but not of Ceylon, is in Hermann's Herbarium, and is n. 137 of Fl. Zeylanica. The specimen, which is the type for the species, is in young bud, and agrees well with Java specimens. It was probably from a cultivated tree. (See Brandis, Forest Flora, 291, and Trimen in Journ. Linn. Soc. xxiv. 140.)

LXXX.—EBENACEÆ.

TREES, l. alt., entire, without stip., fl. small, regular, unisexual, diœcious (rarely monœcious), axillary; cal. free, usually enlarged in fruit, segm. 3–5; cor. tubular or campanulate, lobes 3–5, contorted; male fl.:—stam. 4–64, inserted at base of cor., fil. often unequal, distinct or connate in pairs; fem. fl.:—staminodes (when present) 4–16, ov. superior, 3–16-celled, with 1 or 2 ovules in each cell; fruit indehiscent, usually fleshy; seeds large, few, 2–10, embryo in axis of copious sometimes ruminate endosperm.

Fl. 3-merous . . . . 1. MABA.
Fl. 4- or 5-merous . . . . 2. DIOSPYROS.

All our twenty-four species of this specially Indo-Malayan Family are low-country trees, only two or three extending upwards into the lower montane zone. In the moist region twenty species occur, of which sixteen are restricted to its bounds; in the dry region only eight are found, four being peculiar to it, viz., *Diospyros montana*, *oocarpa*, *Melanoxylon*, and *affinis*. No less than twelve species are endemic, three of *Maba* and nine of *Diospyros*.

1. **MABA,** *Forst.*

Small trees, l. alt., entire, buds with distichous overlapping scales, young parts hairy; fl. small, unisexual, diœcious, solitary or few in axils; cal. small, sometimes enlarged with fruit, segm. 3, short; cor.-tube cylindrical, lobes 3 (very rarely 4), contorted; stam. 4–16, inserted at very base of cor., often very unequal; ov. 3- (or apparently 6-) celled, with 6 ovules, stigma 3-lobed; fruit dry or slightly fleshy, indehiscent, 1–6-celled and -seeded; seed large, embryo straight, axile, endosperm not ruminate.—Sp. 60; 9 in *Fl. B. Ind.*

Cal. small, not cup-like with fruit.
  L. small (under $3\frac{1}{2}$ in.)
    L. thin, long-acuminate . . . . 1. M. ACUMINATA.
    L. coriaceous, short-acuminate . . 2. M. OVALIFOLIA.
  L. large (over $3\frac{1}{2}$ in.). . . . . 3. M. OBLONGIFOLIA.
Cal. enlarged and cup-like with fruit . . 4. M. BUXIFOLIA.

1. **M. acuminata,** *Hiern*, *Mon. Eben.* 112 (1873).
Macreightia acuminata, Thw. Enum. 424. C. P. 3718.
Fl. B. Ind. iii. 550.

A small tree with slender branchlets, bark blackish, young parts with long silky hair; l. on very short petioles, oval, $2\frac{1}{2}$–$3\frac{1}{2}$ in., obtuse at base, caudate-acuminate, subacute, quite glabrous when mature but silky when young, thin, venation rather conspicuous beneath, lat. veins about 7; fl. sessile, 1–3 together, in axils of bud-scales at base of young shoots below the l., cal. very silky; cor.-tube twice as long as cal., densely silky; stam. 4 or 5; ov. very hairy; fruit globose, over $\frac{1}{4}$ in., sparsely silky-hairy.

Moist low country below 1000 ft., very rare. Hiniduma (Thwaites); Singhe Raja Forest (Lewis). Fl. Feb., March.
Endemic.

2. **M. ovalifolia,** *Hiern*, *Mon. Eben.* 113 (1873).
Macreightia ovalifolia, Thw. Enum. 424. C. P. 3717.
Fl. B. Ind. iii. 551.

A small tree, bark blackish, young parts sparsely covered with long hairs; l. 2–$3\frac{1}{2}$ in., ovate-oval, rounded at base, shortly and bluntly acuminate, glabrous and shining when mature or with a few hairs on midrib beneath, coriaceous, venation rather prominent beneath, lat. veins 5 or 6, petiole $\frac{1}{4}$ in., stout; fl. nearly sessile on the young shoots below the l. (fem. not seen); cal. with long hairs; stam. 13–16; fruit not seen.

Moist low country, very rare. Hiniduma Pattu (Thwaites); Bentota (Col. Clarke); Marakelle Forest, Kuruwiti Korale (Lewis).
Endemic.
I have little material for describing this species. The natives called it 'Kalu-médiriya' at Bentota and 'Ho-médiriya' in Kuruwiti.

3. **M. oblongifolia,** *Hiern, Mon. Eben.* 112 (1873).
Macreightia oblongifolia, Thw. Enum. 183. C. P. 3396.
Fl. B. Ind. iii. 550. Bedd. For. Man. t. 21, f. 1.

A small or moderate-sized tree, bark dark grey, young shoots with copious spreading fulvous silky hair; l. on very short petioles, rather large, 3½–8 in., oblong-oval or oblong-lanceolate, rounded at base, shortly acuminate, glabrous above, more or less fulvous-hairy on veins beneath, rather coriaceous, venation very prominent beneath, lat. veins 8–11; fl. on short stout ped., male crowded in short spicate racemes from axils of past and present l., fem. solitary from lower part of young shoots below the l.; cal. very hairy, male with short segm., fem. cut nearly to base; cor.-tube very hairy, lobes short, rounded; stam. about 12; fruit ¾–1 in., depressed-globose, faintly 6-grooved, densely silky-tomentose; seed ½ in., rounded on back, dull black, testa splitting dorsally.

Moist low country below 1000 ft., rather common. Pasdun Korale; Hewesse; Singhe Raja Forest; Ratnapura; Hiniduma. Fl. March, April.
Endemic.
The timber is said to be good, but I have not seen a specimen; it appears to be one of those called 'Kalu-médiriya.'

4. **M. buxifolia,** *Pers. Syn. Pl.* ii. 606 (1807). **Kalu-habara-liya,** *S.* **Juvarai, Irumpalai,** *T.*
Herm. Mus. 21. Fl. Zeyl. n. 430. Moon Cat. 68. Thw. Enum. 183. Hiern, Mon. Eben. 116. C. P. 477.
Fl. B. Ind. iii. 551. Wight, Ic. t. 763.

A bush or small tree with many twiggy branchlets, bark dark dull grey, rather smooth, young parts slightly hairy; l. very numerous, usually under 1 in. (but often larger) on very short petioles, obovate-oblong or spathulate, tapering to base, very obtuse, often emarginate, coriaceous, narrowly revolute at margin, venation conspicuous but not prominent beneath, lat. veins not distinct from general reticulation; fl. 1–3 in l.-axils; cal. slightly pilose, with triangular acute segm., enlarging and becoming cupular and truncate with fruit; cor. campanulate, twice as long as cal., very hairy outside, lobes oblong-ovate, acute; stam. 6–12; fruit ⅜ in., ovoid, apiculate, nearly glabrous, red; seeds 3 (or less by abortion), plano-convex, yellow.

Var. β, **microphylla,** *Thw.* l. c. C.P. 1916.

L. very small, all under ½ in., cuneate.

Var. γ, **Ebenus,** *Thw.* l. c. *M. Ebenus*, Wight, Ic. tt. 1228, 1229. C. P. 3395.

L. larger, 1½–3½ in., broadly oblong-oval; fruit depressed-globular, nearly ½ in., dull purplish-red.

Var. δ, **angustifolia,** *Thw.* l. c. C. P. 1917.

L. long, 2–4 in., lanceolate, tapering to both ends.

Low country up to 3000 ft. The type common in the dry region. Var. β, Jaffna. Var. γ, moist region. Ambagamuwa; Pasdun Korale. Var. δ, moist region. Pasdun Korale; Hiniduma; Kitulgala; Uma-oya. Fl. Feb.–May; white or pinkish.

Also in most parts of Tropical Asia and Africa, Madagascar.

Hermann gives the S. name 'Highulhænda' for this. The wood is hard and durable. Fruit rather pulpy when ripe, edible. Very variable in foliage; the varieties strongly marked.

2. DIOSPYROS,* *L.*

Trees, l. alt. (very rarely opp. or sub-opp.), entire; fl. small, unisexual, diœcious (very rarely monœcious), axillary; cal. larger in fem. fl. and becoming much enlarged with fruit, segm. 4 or 5 (rarely 0); cor. tubular campanulate or urceolate, lobes 4 or 5, generally short, contorted; male fl.:—stam. 5–64, fil. often unequal, distinct or connate in pairs, the inner ones shorter, anth. narrow often apiculate; ov. rudimentary or 0; fem. fl.:—staminodes (when present) 4–16; ov. 4–16- (usually 8-) celled, with a solitary ovule in each cell; fruit usually globose, supported on the more or less enlarged and hardened cal., pericarp indehiscent, usually thick, with few (2–10) large seeds in soft or fleshy pulp; seeds oblong, somewhat compressed, endosperm copious, equable or more or less ruminate. —Sp. 153; 59 in *Fl. B. Ind.*

Very little is known about many of our species, which are rare or local in the forests of the wet region, and seem to flower but seldom. The native Sinhalese names are vaguely applied or very local, and refer more to the wood than to the trees themselves; and one is rarely able to obtain both wood and herbarium specimens from the same tree, in which way alone it is possible to be justified in definitely deciding the source of the former. The various rare mottled cabinet-woods, which appear to be

* A name of Dalechamps (1586) for the original (Mediterranean) species, *D. Lotus*, with edible fruit. From Διός, Jupiter, and πυρός, grain.

produced only by very old trees, and are known as Calamander (Kalu-médiriya, Wal-médiriya, Ho-médiriya, &c.), have mostly yet to be definitely referred to their respective species.

Endosperm equable, not ruminated.
Cal. of male fl. with evident segm.
Cor. glabrous outside.
Clusters of male fl. sessile . . . . . 1. D. OVALIFOLIA.
Clusters of male fl. peduncled.
Cor. campanulate or urceolate; stam. nearly equal.
L. under 3 in. . . . . 2. D. MONTANA.
L. over 4 in.
Cal.-segm. equal . . . . . 3. D. EMBRYOPTERIS.
Cal. irregularly splitting . . . 4. D. TOPOSIA.
Cor. tubular; stam. very unequal . . 5. D. EBENUM.
Cor. densely tomentose outside.
L. with bristly hair beneath . . . 6. D. PRURIENS.
L. glabrous, or nearly so.
Stam. 4 or 5; fruit pointed.
L. under 5 in. . . . . . . 7. D. ATTENUATA.
L. over 5 in. . . . . . . 8. D. ACUTA.
Stam. 16; fruit depressed-globose. . 9. D. GARDNERI.
Cal. of male fl. nearly truncate.
Fruit under 1 in., oblong-ovoid . . . 10. D. OOCARPA.
Fruit over 2 in., ovate-ovoid . . . . 11. D. QUÆSITA.

Endosperm ruminated.
Cor. of male fl. urceolate . . . . . . 12. D. SYLVATICA.
Cor. of male fl. more or less tubular.
L. tomentose or pubescent beneath.
Fruit glabrous . . . . 13. D. MELANOXYLON.
Fruit hairy . . . . 14. D. HIRSUTA.
L. glabrous beneath.
Male fl. sessile, fascicled; cal.-segm. evident.
Stam. 8–20, unequal.
Fl. 4-merous.
Stam. 16–20 . . . . . . 15. D. INSIGNIS.
Stam. 8 . . . . 16. D. OPPOSITIFOLIA.
Fl. 5-merous, stam. 10–12 . . . 17. D. THWAITESII.
Stam. 5, equal . . . . . . 18. D. MOONII.
Male fl. pedicellate, cymose; cal.-segm. very shallow.
Cal. of fem. fl. with acuminate segm. . 19. D. AFFINIS.
Cal. of fem. fl. with rounded apiculate segm . . . . 20. D. CRUMENATA.

1. **D. ovalifolia,** *Wight, Ic.* iv. pt. 1, 50 (1850). **Kunumella, Habara,** *S.* **Vedukkanari,** *T.*
Thw. Enum. 181. C. P. 1815 (2533).
Fl. B. Ind. iii. 557. Wight, Ic. t. 1227.

A moderate-sized tree, bark greyish-brown, rough, buds slightly pubescent; l. 2–5 in., lanceolate-oblong, tapering to base, obtuse or rounded at apex, glabrous, rather thick, paler

beneath and with prominent venation, petiole $\frac{1}{4}$ in.; fl. sessile, in sessile clusters in axils of fallen l., fem. sometimes solitary, larger; cal. hairy, segm. 5 (or 4), obtuse or rounded; cor.-tube inflated, lobes 4 or 5, shorter than tube, acute; male fl.:—stam. 14–20, slightly unequal; rudimentary ov. conical; fem. fl.:—staminodes 1–7 usually 4; ov. hairy, 4-celled, stigmas 2, reniform; fruit globose, rather small, about $\frac{3}{4}$ in., glabrous, glaucous-green, segm. of enlarged cal. thick, reflexed, densely tomentose on both sides; seed usually solitary, globose, endosperm equable.

Low country in the dry region; rather common. Also in the moist region 2000–4000 ft.; rare, *e. g.*, Hewahette, and between Haldummulla and Haputale. First found by Moon at Trincomalie. Fl. Jan.–April; cream-coloured.

Also in S. India.

Heart-wood brown streaked with black, very inferior to true Ebony.

2. **D. montana,** *Roxb. Cor. Pl.* i. 37 (1795). **Mulkarunkali, Katukanni, Vakkana,** *T.*

Thw. Enum. 423 and (*D. cordifolia*) 178. Hiern, Mon. 220. C. P. 1909 (♂), 3774 (♀).

Fl. B. Ind. iii. 555. Wight, Ic. t. 1225; Ill. t. 148 (*D. cordifolia*).

A small tree, bark yellowish-grey, smooth, young parts glabrous or pubescent, branchlets sometimes contracted into sharp spines; l. small, $1\frac{1}{2}$–3 in., oval- or lanceolate-oblong, rounded or subcordate (rarely acute) at base, obtuse or rounded at apex, usually glabrous, sometimes pubescent beneath or on both sides, thin, venation inconspicuous, petiole $\frac{1}{4}$ in., slender; fl. rather small, fem. larger, on short glabrous or pubescent ped., the male in stalked clusters of 3, the fem. solitary, axillary or on lower part of twigs below the l.; cal.-segm. 4, rounded, nearly glabrous; cor. urceolate, lobes 4, shorter than tube; male fl.:—stam. 16, nearly equal; fem. fl.:—staminodes 4, ov. conical, glabrous, 8-celled, stigmas 4; fruit small about $\frac{3}{4}$ in., depressed-globose, apiculate, glabrous, shining, cherry-red passing into brownish-black, enlarged cal. reflexed; seeds 3–6, $\frac{3}{8}$ in. long, roughish, black, endosperm equable.

Dry region; rather common. Jaffna; Matalan; Trincomalie; Vavuniya; Puttalam; Mannar. Fl. March.

Throughout India, Malaya, Burma, Trop. Australia.

Often has spines, whence the first Tamil name. The specific name is unfortunate, as the tree has no tendency to ascend into the hills, and the synonym *D. cordifolia*, Roxb. (of the same date) is preferable. The leaves dry blackish. Has a black heart-wood. Possibly 2 species here. The tree with pubescent l. and thorns seems to have a much smaller fruit, and was called 'Karuntali' at Mannar.

3. **D. Embryopteris,** *Pers. Syn. Pl.* ii. 624 (1807). **Timbiri,** *S.* **Panichchai,** *T.*

Embryopteris glutinifera, Roxb., Moon Cat. 70. Thw. Enum. 178. C. P. 1915.

Fl. B. Ind. iii. 556. Wight, Ic. tt. 843, 844 (*E. glutinifera*). Bedd. Fl. Sylv. t. 69. Bentl. and Trim. Med. Pl. t. 168 (from a Ceylon specimen).

A moderate-sized or large tree with a thick fluted trunk and many spreading branches forming a dense wide head, bark thick, rather smooth, blackish, flaking off in large pieces, twigs stout, young parts silky; l. numerous, spreading distichously, persistent, large, 5–7 in., oblong or lanceolate-oblong, usually tapering, rarely rounded at base, obtuse or subacute, glabrous, rather coriaceous, veins translucent not prominent when living but becoming so when dried, petiole ½ in., thick, rigid; male fl. rather small, 2–5 together, on short ped. in shortly pedunculate pubescent racemose cymes; cal. shallowly cup-shaped, silky, segm. 4 very broad; cor. broadly campanulate, very thick, lobes 4, very short, spreading; stam. 24–64, usually 40, equal, anth. linear, fil. extremely short, ov. reduced to a lobed fleshy disk; fem. fl. much larger than male, 1 in. diam., solitary, on short ped., cal. glabrous or pubescent, segm. 4, deep, erect, broadly ovate, cordate and dilated at base, acute; cor. campanulate, lobes 4, deep, cordate, obtuse, recurved; staminodes usually adnate to cor.-tube; ov. hairy, 8-celled, styles 4, stigmas lobed and undulated; fruit large, 1½–3½ in., subglobose, very thick, covered with a hard rusty mealiness readily detached, yellow, 8-celled, enlarged cal. spreading or reflexed, pericarp thin, pulp viscid and glutinous; seeds 4–8, oblong, flattened, smooth, reddish-brown.

Var. β, **atrata,** *Thw. l. c.* C. P. 2731.

L. thinner, densely covered, as also the buds, inflor. and cal., with long black hair.

Var. γ, **nervosa,** *Thw. l. c.* C. P. 1910.

L. very coriaceous, shorter and broader, venation prominent on both sides, inflor. and cal. covered with black hair; cal.-segm. greatly enlarged with fruit, erect, as long as fruit.

Low country; very common in the dry region, especially by streams, much rarer in the moist. Var. γ, moist region only. Galle; Reigam Korale; Ratnapura. Fl. May; yellow, sweet-scented, white in var. γ.

Also in India and Malaya.

The juice of the unripe fruit is very astringent, and is included in the official Indian Pharmacopœia. Here the bark alone seems to be used medicinally, and as an external application only; but the juice of the fruit is much employed as a tan for fishing-nets and for the planks of

boats. Wood rather heavy, moderately hard, white, with very little dark brown heart-wood, used for building, but inferior.

4. **D. Toposia,*** *Ham. in Trans. Linn. Soc.* xv. 115 (1827). **Kahakala, Kaluwella,** *S.*

Thw. Enum. 179. C. P. 1911.

Fl. B. Ind. iii. 556. Wight, Ic. t. 416 (*D. racemosa*). Bedd. Ic. Pl. Ind. Or. t. 122 (not good).

A moderate-sized tree with numerous branches forming a dense rounded head, bark dark grey-brown, rather smooth, thick, young parts glabrous ; l. numerous, distichously spreading, persistent, large, 4–8 in., oval or lanceolate, acute or rounded at base, acuminate, obtuse or subacute, glabrous, rather coriaceous, venation closely reticulate, translucent, prominent on both sides when dry, bright green, paler beneath, petiole $\frac{3}{8}$–$\frac{1}{2}$ in., stout, channelled ; fl. on short ped., male cymes small, pedunculate, axillary or from the year's growth below the l., fem. usually solitary, buds globose, apiculate ; cal. pilose, completely closed in bud and irregularly splitting into 2–4 acute segm. ; cor. ovoid-urceolate, lobes 4, short, acute, spreading ; stam. about 32, rather unequal, fil. very short ; staminodes (in fem. fl.) 12–16 ; ov. hairy, 4- (rarely 6-) celled, stigmas 4, short ; fruit 1–1$\frac{3}{4}$ in., ovoid-globose, with a scurfy pubescence easily removed, enlarged cal. rather small ; seeds 4, oblong-ovoid, very slightly compressed.

Moist region to 3000 ft.; rather common. Singhe Raja Forest; Hantane; Rakwane; Balangoda. Fl. May; white.

Also in E. Bengal and Burma.

The timber is without coloured heart-wood. The leaves are easily recognised by the very distinct and close reticulate venation.

5. **D. Ebenum,** *Kœnig in Lund Physiogr. Sälsk. Handl.* i. 176 (1776). **Kaluwara,** *S.* **Karunkali,** *T.*

Linn. f. Suppl. Pl. 440. Retz. Obs. Bot. v. 31. Moon Cat. 74. *D. Ebenaster*, Roxb. Fl. Ind. ii. 529 (non Retz.). Thw. Enum. 180. Hiern, Mon. 208. C. P. 1912.

Fl. B. Ind. iii. 558. Bedd. Fl. Sylv. t. 65.

A large tree, with an erect trunk and dense leafy head, bark dark grey, finely longitudinally cracked, young parts sparsely adpressed, pubescent ; l. numerous, spreading dichotomously, 2–4 in., oblong-oval or oblong-lanceolate, acute or rounded at base, usually somewhat acuminate, obtuse or rounded at apex, glabrous, bright green and shining above, paler beneath, rather thick, venation reticulate pellucid, petiole $\frac{1}{4}$ in. or less ; fl. sessile, male in very shortly stalked clusters

---

* From the Bengali name.

of 3–6, buds linear tapering; cal.-segm. 4, shallow, rounded; cor.-tube tubular, lobes 4, as long as tube, oblong, subacute; stam. about 16, fil. very unequal, often connate in 2's or 3's, anth. acuminate, white; fem. fl. solitary, larger than male, cal.-segm. 4, long, deflexed, staminodes 8, ovate; ov. glabrous, 8-celled, stigmas 4; fruit rather small, under $\frac{3}{4}$ in., usually depressed-globose, sometimes ovoid, apiculate, glabrous, enlarged cal. forming a shallow woody cup from the back of which project the large acute thickened segm.; seeds 3–8, $\frac{3}{8}$ in., dull black, endosperm equable.

Forests chiefly in the dry region (especially in the N.E. portion and near Puttalam); common, and often gregarious. In the moist region rarer and sporadic, extending up to 4000 ft., *e. g.*, Colombo; Pasdun Korale; Hiniduma; Hantane; Deltota, &c. Fl. March; pale greenish-yellow.

Also in S. India and Malaya.

The leaves vary considerably in form and venation; in the moist region they are larger (often 6 in.) and more acuminate, and agree with *D. assimilis* (Bedd. For. Rep. 1867, p. 20, t. 1) from S. Canara.

Though the heart-wood, Ebony, has been known from distant times, the tree is not mentioned by Hermann, and the wood only by Burm. (Thes. 91), who quotes from Grimm, 'Laboratorium Ceylanicum' (1679), as to its medicinal virtues. In Rumph's Herb. Amboin. iii. 4, it is, however, noted that Ebony trees are abundant about 'Trinkenemale,' and this (1750) is the earliest record I find. Kœnig first definitely distinguished the tree botanically.

Wood very heavy and hard, heart-wood large, jet black, or with some narrow brownish streaks. No other species of *Diospyros* in Ceylon affords a pure black heart-wood besides *D. Ebenum.*

A large export, though much less than formerly, takes place from Trincomalie and other ports, and much goes to China, where it is employed for the manufacture of the small black pipes used in smoking opium. In 1893, out of a total export of 6381 cwt., no less than 2712 cwt. were for China, and 2485 cwt. for the United Kingdom.

6. **D. pruriens,** *Dalz. in Kew Journ. Bot.* iv. 110 (1852).
Thw. Enum. 423. Hiern, Mon. Eben. 185. C. P. 2836.
Fl. B. Ind. iii. 553. Bedd. Ic. Pl. Ind. Or. t. 129.

A small tree, branchlets tomentose, young parts with copious spreading bristly hair, l. $2\frac{1}{2}$–3 in., oblong-lanceolate, rounded at base, shortly and bluntly acuminate, glabrous when mature, previously with long yellow bristly hair on midrib and margin and on veins beneath, thin, petiole short, very bristly-hairy; fl. and fruit not seen.

Moist low country; very rare. Gilimale, Sabaragamuwa, 1853 (Thwaites), not in flower; Marakelle Forest, Kuruwiti Korale (Lewis).

In South-western India, common, according to Beddome.

The Fl. B. Ind. excludes Thwaites' plant from this species, but does not refer it to any other.

The fruit is said to be covered with stinging fulvous hairs.

7. **D. attenuata,** *Thw. Enum.* 182 (1860).
Thw. Enum. 182. Hiern, Mon. Eben. 182. C. P. 3478.
Fl. B. Ind. iii. 561. Bedd. Ic. Fl. Ind. Or. t. 139.

A small or moderate-sized tree, young parts sparingly and minutely strigose; l. 2–4½ in., lanceolate or oblong-lanceolate, acute at base, caudate-acuminate, obtuse or subacute, glabrous, thin, lat. veins fine, close, not conspicuous, petiole very short; fl. small, sessile, male in dense clusters of 3–8, female solitary, much larger; cal. strigose-hairy, segm. 4 or 5, lanceolate, acute; stam. 4 or 5; ov. 4-celled, stigmas 2; fruit 1¼ in., ovoid, with an attenuate point, finely puberulous; seeds 2 or 3, oblong, acuminate, dark brown, shining, endosperm equable.

Moist low country; very rare. Only found at Hewesse, Pasdun Korale, where it is exceedingly abundant in some of the forests. Fl. Sept.; pale green.
Endemic.

8. **D. acuta,** *Thw. Enum.* 182 (1860).
Thw. Enum. 182. Hiern, Mon. Eben. 182. C. P. 3476.
Fl. B. Ind. iii. 561.

A moderate-sized tree, buds adpressed-pubescent; l. large, 5–12 in., narrowly lanceolate-oblong, rounded at base, gradually attenuate, acute, glabrous or with a few strigose hairs beneath, coriaceous, midrib thick, very conspicuous, channelled above, lat. veins obscure, petiole ½–⅝ in., very stout, channelled above; fl. sessile, with fulvous-hairy bracts, rather large, male in axillary crowded clusters of 3–20, fem. solitary or very few; cal. densely covered with adpressed fulvous hair, segm. 5, deep, linear-lanceolate, acute; cor. densely villous outside; stam. 4 or 5; fruit (? ripe) 1 in., ovoid, attenuate, pointed, adpressed-pubescent becoming glabrous, cal. slightly enlarged; seeds 2 or 3, oblong, acuminate, endosperm equable.

Moist low country; very rare. Collected by Thwaites at Hewesse, Pasdun Korale. Fl. Sept.; pale green.
Endemic.
Thwaites remarks that the fl. are sometimes monœcious, the fem. clusters being towards the top of the branches, the male below.

9. **D. Gardneri,** *Thw. Enum.* 181 (1860). **Kadumbériya, Kallu,** *S.*
Patonia Walkerii*, Wight, Ill. i. 19. Thw. Enum. 181. C. P. 1908.
Fl. B. Ind. iii. 561. Bedd. Ic. Fl. Ind. Or. t. 132.

A moderate-sized tree, bark thick, blackish, twigs cylindrical, shining, young parts finely pilose; l. 4–8 in., oval-

* See under *Xylopia parvifolia* (Pt. i, p. 28) for the other species of this curious genus of Wight's.

lanceolate, acute at base, acuminate, obtuse, glabrous and shining, pale beneath, thin, venation pellucid, lat. veins oblique, prominent beneath and depressed above so that upper surface is somewhat bullate, petiole $\frac{1}{4}$ in.; fl. on short stout pilose ped., male in clusters of 2–12, fem. solitary; cal. pubescent, segm. 4, deep, lanceolate, acute, erect in male, reflexed in fem.; cor. $\frac{1}{2}$ in., densely silky outside, glabrous within, tube inflated, lobes 4, shorter than tube, oval, acute; stam. 16, unequal in length, fil. hairy, anth. apiculate; ov. 8-celled; fruit 1–1$\frac{1}{4}$ in., depressed-globose, apiculate, at first fulvous-tomentose, afterwards glabrous, cal. much enlarged, cup-shaped, densely fulvous within, concealing lower half of fruit.

Moist region up to 2000 ft.; common. Colombo; Ratnapura, &c.; Kurunegala Dist.; Hantane; S. Prov. Fl. Jan., April, May; creamy-white.

Endemic.

This is probably Moon's *D. Ebenaster* (Cat. 74), 'Bastard Ebony,' from Kandy. Mr. F. Lewis says it is called 'Kallu' in Kuruwiti Korale, and it is one of the timbers to which the name 'Homediriya' is applied. It appears to be a variable species. Heart-wood none or very small.

10. **D. oocarpa,** *Thw. Enum.* 180 (1860). **Kalu-kadumbériya,** *S.* **Vellai-karunkali,** *T.*

Thw. Enum. 180. Hiern, Mon. Eben. 171. C. P. 1914.
Fl. B. Ind. iii. 560.

A moderate-sized tree, bark yellowish, young shoots minutely puberulous; l. 2–3$\frac{1}{2}$ in., ovate or ovate-oval, usually rounded at base but suddenly tapering there into short flattened petiole, shortly and broadly acuminate, obtuse, glabrous and shining, subcoriaceous, veins inconspicuous; fl. nearly sessile, in small very shortly stalked clusters, the fem. rather larger; cal. cylindrical, nearly truncate (segm. obscure), pubescent; cor. tubular, tomentose outside, lobes narrowly oblong; stam. 9–12, unequal; ov. 8- or 6-celled; fruit $\frac{3}{4}$–1 in. long, oblong-ovoid, rounded at top, apiculate, lobulate on surface, 6-celled, cal. slightly enlarged, flat, circular; seeds oblong, endosperm plane.

Low country in the dry or intermediate region; rather rare. Haragama; Uma-oya; Kurunegala; between Nalande and Dambulla; Maturata. Fl. April.

Also in S. India.

Said to afford a Calamander-like heart-wood.

11. **D. quæsita,** *Thw. Enum.* 179 (1860). **Kalumédiriya,** *S.*

D. hirsuta, Moon Cat. 74 (non L. f.). Thw. Enum. 179. C. P. 3010.
Fl. B. Ind. iii. 560. Bedd. Ic. Fl. Ind. Or. t. 128 (not good).

A large tree with an erect trunk and horizontal branches, bark blackish-grey, thin, usually smooth or with slight longi-

tudinal fissures, young parts minutely adpressed-puberulous; l. $3\frac{1}{2}$–$6\frac{1}{2}$ in., oblong-oval or oblong-lanceolate, acute at base, shortly acuminate, obtuse, sometimes twisted at apex, glabrous, dark green, paler beneath, subcoriaceous becoming very stiff when old, nervation not pellucid, lat. veins numerous, fine, not conspicuous (more so and prominent when dried), nearly horizontal, anastomosing, petiole $\frac{1}{4}$–$\frac{3}{8}$ in., stout, flattened and slightly channelled above; male fl. on short drooping ped., 3–7 in nodding clusters often below the l.; cal. ovoid-cylindrical, truncate or very shortly 5-toothed, pubescent; cor. $\frac{3}{8}$–$\frac{1}{2}$ in. densely pubescent inside and out, lobes 5, broadly ovate, subacute; stam. about 16; fem. fl. (not seen) solitary; cal.-segm. deep; fruit very large, $2\frac{1}{2}$–3 in. long, ovate-ovoid, very blunt or depressed on top but usually tipped with a central mamilla, glabrous, apple-green, cal. very much enlarged, flattened, woody but not very thick, with the segm. wide, acute, often cordate, deflexed and pouched at the base, inner layer of pericarp very hard and bony, lobulated, white; seeds 4–10, large, nearly $1\frac{1}{2}$ in., oblong-ovoid, compressed, smooth and highly polished, orange-brown, embryo large, in axis of pearly equable endosperm.

Forests of the moist low country below 1000 ft.; rare. Singhe Raja Forest; Hiniduma; Potapitiya, Kukul Korale; Karawita Kande; Ratnapura; Dotalankanda, Pasdun Korale. Fl. April.

Endemic.

This affords the finest of the variegated woods known as Calamander. The tree is much sought after, and, from being destroyed in many places, is becoming more and more scarce. Thunberg in 1777 first discovered 'Calaminder' wood to be produced by a species of *Diospyros* (see his 'Travels,' vol. iv.).

The shape and large size of the fruit afford a ready means of determining this species, and the venation of the large leaves is also characteristic.

12. **D. sylvatica,** *Roxb. Cor. Pl.* i. 37 (1795). **Sudu-kadumbériya,** *S.*

Thw. Enum. 178. C. P. 2729.

Fl. B. Ind. iii. 559. Bedd. Ic. Pl. Ind. Or. t. 121.

A moderate-sized tree, trunk rather slender, bark blackish-grey, buds silky; l. 3–5 in., oval, acute at base and slightly decurrent on a short flattened petiole, acuminate, obtuse at apex, glabrous and shining above, paler beneath, veins pellucid; fl. on short ped., on the young shoots below the l. or in lowest axils, male in small shortly peduncled clusters, female solitary, larger; cal. pubescent, segm. 4 (or 3), short and rounded in male, ovate-oblong acute in fem., cor. urceolate, lobes 4 (or 3), short; stam. about 22, nearly equal, anth.

tapering; ov. 8- (or 6-) celled; fruit nearly ¾ in., globose, smooth, dark green, cal. much enlarged, flat, spreading, foliaceous; seeds 2–8, oblong, endosperm ruminate.

Moist low country, and up to 4000 ft.; rather rare. Hantane; Watagoda; Eknaligoda; Singhe Raja Forest. Fl. April; white.
Also in S. India.
Turns black in drying.

13. **D. Melanoxylon,** *Roxb. Cor. Pl.* i. 36 (1795).
Fl. B. Ind. iii. 564.
Roxb. Cor. Pl. t. 46. Bedd. Fl. Sylv. t. 67 (*D. Wightiana*).

A small tree, branches irregular, bark deeply fissured both transversely and vertically, in alternate grey and black layers, young shoots fulvous-pubescent; l. 3–5 in., oblong-oval or oblong-lanceolate, acute at base, obtuse or rounded at apex, glabrous above, more or less densely tomentose beneath, petiole very short, tomentose; fl. not seen; fruit 1–1¼ in., globose, glabrous, cal. slightly enlarged, flat, undulate, with 4–6 ovate-triangular acute segm., densely tomentose.

Low country in the dry region, very rare. Only found between Bibile and Ekiriankumbura, Uva; first in Jan. 1888 in fruit.
Also in Peninsular India.
Roxburgh (Fl. Ind. ii. 531) gives Ceylon for his *D. Melanoxylon*, and is followed by De Candolle and the Fl. of Brit. Ind.; but it was unknown here to Thwaites, and there are no known specimens from the Island, except from the above locality. My specimens are poor and without flowers, but agree fairly well with Roxburgh's figure, though scarcely with Beddome's. This is the 'Ebony' tree of S. India, but the wood is much inferior to that of *D. Ebenum; D. Tupru*, Buch.-Ham., is scarcely distinguishable.

14. **D. hirsuta,** *L. f. Suppl. Pl.* 440 (1781).
Thw. Enum. 181. Hiern, Mon. Eben. 163. C. P. 382.
Fl. B. Ind. iii. 565. Bedd. Ic. Fl. Ind. Or. t. 137.

A moderate-sized tree, branchlets and young parts densely ferrugineo-tomentose; l. 4–7 in., oval or oblong-oval, usually rounded at base, acuminate, obtuse or subacute, glabrous when mature above, usually densely and finely pubescent beneath, petiole ¼ in.; fl. sessile, male in dense clusters, fem. larger, usually solitary; cal. densely ferrugineo-tomentose, segm. 5, deeper and broader in fem.; cor. thick, lobes 5, acute; stam. 5, anth. nearly sessile, apiculate; ov. usually 10-celled, densely hairy; fruit ⅝–1 in., broadly ovoid, apiculate, densely clothed with rufous hair, enlarged cal. nearly flat, segm. spreading, undulated; seeds 6–10, ½–⅝ in. long, endosperm ruminate.

Forests in moist low country, rather rare. Kukul Korale; Galle; about Ratnapura, &c., frequent; Nowadun Korale (Lewis). First collected by Thunberg in 1777. Fl. March, April; pale brownish-yellow.

Endemic.

Thwaites notes that fem. fl. are sometimes intermixed with the male. A variety from Bambarabotuwa has the l. less pubescent beneath, the fruit larger, and the seeds $\frac{7}{8}$ in. long.

15. **D. insignis,** *Thw. Enum.* 180 (1860). **Gona, Poruwamara, Wal-médiriya,** *S.*

Thw. Enum. 180. Hiern, Mon. Eben. 157. C. P. 2730 (3477).
Fl. B. Ind. iii. 564. Bedd. Ic. Fl. Ind. Or. t. 130.

A large tree, young parts adpressed-pubescent, l. (often sub-opposite) 4–12 in., oval- or lanceolate-oblong, rounded or acute at base, tapering to acute apex, glabrous, paler beneath, not coriaceous, venation conspicuous, prominent beneath, lat. veins 9–13, connected by fine parallel transverse veinlets, petiole short, very stout; fl. nearly sessile, male numerous, in crowded clusters, fem. larger, solitary or 2 together; cal. pubescent, segm. 4, deep, ovate, acute; cor. pubescent outside, tube cylindrical, lobes 4, much shorter than tube, acute, spreading; stam. 16–20, very unequal; ov. 8-celled; fruit large, $\frac{3}{4}$–$1\frac{1}{4}$ in., subglobose, depressed and somewhat 4-lobed on top, glabrous but rather rough with small prominences, enlarged cal. very hard and woody, deeply cupped with a sharp edge, quadrangular; seeds $\frac{3}{4}$–1 in., much compressed, purplish-brown, embryo large, endosperm ruminate.

Moist low country up to 2000 ft., rather common. Near Kandy; near Polgahawela; Ambagamuwa; Avisawella; Kuruwiti Korale; Hewesse; Kalutara (Moon); Kottawa, near Galle. Fl. March and September; white.

Also in Anamalai Hills, S. India.

The fruit is much like a large acorn in outward appearance, and in size nearly equals that of *D. quæsita.* The heart-wood is very small, black with paler streaks, and is one of those called 'Kalumédiriya.'

16. **D. oppositifolia,** *Thw. Enum.* 181 (1860). **Kalumédiriya,** *S.*

Thw. Enum. 181. Hiern, Mon. Eben. 157. C. P. 3011.
Fl. B. Ind. iii. 565. Bedd. Ic. Fl. Ind. Or. t. 131.

A moderate-sized tree, young parts fulvous-pubescent; l. opp., rather small, 3–5 in., oval, obtuse at base, very shortly acuminate, obtuse at apex, glabrous, rather thick, lat. veins inconspicuous, the small connecting ones parallel, petiole very short; male fl. sessile, 1–3 together; cal. small, hairy, segm. 4, narrowly triangular, acute; cor. hairy, tube narrow, lobes 4, acute, stam. 8, unequal, anth. apiculate; fem. fl. and fruit not seen.

Moist low country, very rare. I have seen only the C. P. specimens collected at Hiniduma in 1853. Fl. December; white.

Endemic.

According to Thwaites, the timber of this very much resembles true Calamander wood. The tree requires more careful examination, but is almost unknown.

17. **D. Thwaitesii,** *Bedd. Ic. Pl. Ind. Or.* 27 (1874).

D. Candolleana, Thw. Enum. 181 (non Wight). *D. hirsuta*, var., Hiern, Mon. 164. C. P. 3394.

Fl. B. Ind. iii. 566. Bedd. Ic. Pl. Ind. Or. t. 135.

A moderate-sized tree, twigs slender, young parts ferrugineo-tomentose; l. rather small, 3–5 in., oval or lanceolate, subacute at base, tapering and long-acuminate at apex, glabrous when mature, lat. veins inconspicuous; fl. sessile, 1–3 together; cal. densely rufous-hairy, segm. 5, short, broad, apiculate; cor.-lobes 5, rounded, recurved; stam. 10–12, unequal, anth. strongly apiculate; ov. 4-celled; fruit about $\frac{3}{4}$ in., globose or broadly ovoid, apiculate, rufous-tomentose becoming glabrous; seeds slightly compressed, transversely striate, black, endosperm ruminate.

Forests in moist low country, rather rare. About Ratnapura; Hiniduma; Singhe Raja Forest (Lewis). Fl. April; white.

Endemic.

Hiern combines both this and *D. Moonii* under *D. hirsuta;* and the present is certainly very close to it. Has no coloured heart-wood (F. Lewis).

18. **D. Moonii,** *Thw. Enum.* 182 (1860).

Thw. Enum. 182. *D. hirsuta*, var., Hiern, Mon. Eben. 164. C. P. 2833.

Fl. B. Ind. iii. 566. Bedd. Ic. Fl. Ind. Or. t. 138.

A moderate-sized tree, young parts slightly pilose, buds silky, l. large, 5–10 in., oblong-lanceolate, rounded at base, shortly acuminate, obtuse, glabrous above, sparsely hairy becoming glabrous beneath, leathery, midrib very prominent beneath, channelled above, lat. veins inconspicuous, petiole $\frac{1}{4}$ in., thick; fl. sessile mostly in axils of fallen l., male in clusters of 6–10, fem. 1 or 2 together; cal. densely fulvous-pubescent, segm. 5, as long as tube, acute, with reflexed margins in fem., stam. 5; ov. 10-celled; fruit large, $1\frac{1}{2}$ in., globose, at first covered with fulvous hair afterwards glabrous, enlarged cal. almost flat, segm. acute, spreading; seeds 6–10, oblong-oval, much compressed, transversely striate, endosperm strongly ruminate.

Moist low country, rare. Kalutara Dist. (Moon); Hewesse (Thwaites). Fl. Sept.

Endemic.

19. **D. affinis,** *Thw. Enum.* 179 (1860).
C. P. 2924.
Fl. B. Ind. iii. 566. Bedd. Ic. Fl. Ind. Or. t. 127.

A moderate-sized tree, buds pilose, l. small, $1\frac{1}{2}$–$3\frac{1}{2}$ in., oval or oblong-oval, acute or obtuse at base, obtuse or rounded at apex, glabrous and shining, stiffly coriaceous, paler beneath, venation reticulate, rather conspicuous beneath, petiole $\frac{1}{4}$–$\frac{3}{8}$ in., flattened above; male fl. small, nodding on short ped., 3–7 in small stalked spreading cymes, fem. fl. larger on pilose ped.; cal.-segm. 4, in male very short, apiculate, in fem. deep, with pouches between them, acuminate; cor. tubular, lobes 4, rounded; stam. 9, slightly unequal, anth. bluntly acuminate; ov. 6-celled; fruit about 1 in., nearly globose, apiculate, glabrous, enlarged cal. flat, spreading; seeds usually 4, ovoid, dark brown, shining, transversely striate, endosperm ruminate.

Intermediate region, very rare. Only certainly known from between Uma-oya and Billahul-oya on the Lower Badulla Road from Kandy. Fl. July; greenish-white.

Also in Tinnevelly, S. India.

Specimens, in leaf only, sent me from Mannar under the name of 'Pulima' are probably this species.

D. opaca, Clarke, Fl. B. Ind. iii. 567, is based on a solitary male specimen from Thwaites, of C. P. 2924, in Herb. Kew. Hiern included it under *D. affinis*. I find nothing in Peradeniya Herb. agreeing with Clarke's description.

20. **D. crumenata,** *Thw. Enum.* 179 (1860).
C. P. 2438.
Fl. B. Ind. iii. 567. Bedd. Ic. Fl. Ind. Or. t. 126.

A large tree, twigs glabrous; l. 2–5 in., oblong-oval, rounded or subacute at base, shortly and abruptly acuminate, obtuse at apex, glabrous and shining, subcoriaceous, venation reticulate, rather prominent, petiole $\frac{1}{4}$–$\frac{3}{8}$ in.; male fl. on short drooping ped., 3–7 in shortly stalked cymes, cal. tubular-cup-shaped densely tomentose, segm. 4, obscure or very shallow, obtuse; fem. fl. larger, solitary, on short stout ped., cal. large, cup-shaped, tomentose on both sides, segm. 4, deep, broad, rounded, apiculate, with large and deep pouches between them; cor. densely tomentose, lobes 4, broad, acute, spreading or reflexed; stam. about 12, unequal; ov. 8-celled; fruit large, $1\frac{1}{4}$–2 in., globose or slightly ovoid, glabrous, cal. much enlarged, nearly flat; seeds 6–8, black and shining, endosperm ruminate.

Moist region, 2000–4000 ft., rather rare. Deltota; Uduwella; below Haputale. Fl. April, May; cream-white.

Endemic.

Heart-wood very small or none.

LXXXI.—STYRACEÆ.

TREES or shrubs, l. alt., without stip., buds with external scales; fl. regular, bisexual, bracteate in axillary spikes or racemes; cal.-tube adnate to ov., segm. small, 5, imbricate; cor.-tube reduced to a mere ring (rarely elongated), lobes (almost distinct pet.) 5, imbricate; stam. numerous in several rows, adnate to base of cor., fil. unequal, anth. short; ov. inferior, 3- (rarely 2-) celled, with 2 pendulous ovules in each cell, style simple, stigma slightly 3-lobed; fruit a drupe, stone bony, 1–3-seeded; seed with abundant endosperm.

The nearly distinct petals and numerous stamens give a very Rosaceous or Myrtaceous look to the flowers of this Family.

Of our nineteen species, all, except *Symplocos spicata* and *S. obtusa*, are endemic, and all are confined to the moist region. To the low country seven are restricted, ten are found only in the montane zone, and two extend into both. The species are difficult to distinguish, especially those of the hill-country, and these require a more careful comparison with those of the Nilgiris than they have yet received.

SYMPLOCOS,* *L.*

For characters, see Order.—Sp. 160; 64 in *Fl. B. Ind.*

Cor. divided into almost distinct pet.
  Inflor. often compound . . . . . . 1. S. SPICATA.
  Spikes or racemes always simple.
    L. equally dispersed on the year's growth.
      L. glabrous on both sides.
        L. coriaceous.
          Bracts small, glabrous.
            L. rounded at apex . . . . . 2. S. OBTUSA.
            L. acuminate, acute . . . . . 3. S. LÆTA.
          Bracts large, strongly ciliate . . 4. S. BRACTEALIS.
        L. thin . . . . 5. S. VERSICOLOR.
      L. more or less hairy, hispid or tomentose on veins beneath.
        Cal.-tube hairy or silky.
          Hairs on l.-veins adpressed.
            Lat. veins inconspicuous above . 6. S. ACUTA.
            Lat. veins impressed above . . 7. S. CUNEATA.
          Hairs on l.-veins spreading.
            L. broad, shortly acuminate . . 8. S. HISPIDULA.
            L. narrow, tapering, very acute . 9. S. JUCUNDA.

---

* From συμπλοκή, union, alluding to the slight cohesion of the cor.-lobes at the base; name given by Jacquin to an American species.

Cal.-tube glabrous.
L. under 4 in.; racemes slender.
L. cordate-acuminate, distinctly denticulate . . . . . 10. S. ANGUSTATA.
L. oblong, sharply serrate . . 11. S. LATIFLORA.
L. oval, entire, thin . . . . . 12. S. ELEGANS.
L. broadly oval, denticulate, thick and rigid . . . . 13. S. MINOR.
L. over 4 in.; racemes stout . . 14. S. HEBANTHA.
L. crowded at end of year's growth (see also No. 7).
L. nearly sessile; cal.-tube glabrous . 15. S. CORDIFOLIA.
L. petiolate; cal.-tube hairy.
L. acute at base.
L.-veins strigose beneath . . . 16. S. APICALIS.
L.-veins densely velvety beneath . 17. S. MARGINALIS.
L. cordate at base . . . . . 18. S. CORONATA.
Cor. with an obvious tube (*Ciponima*) . . . 19. S. PAUCIFLORA.

1. **S. spicata,** *Roxb. Hort. Beng.* 40 (1814). **Bombu, Wal-Bombu,** *S.*

Herm. Mus. 9. Burm. Thes. 26, 139. Fl. Zeyl. n. 409 (*Eugenioides*). *Myrtus laurinus*, Retz. Obs. Bot. iv. 26. *Eugenia laurina*, Willd. Moon Cat. 38. *Bobua* laurina*, DC. Prod. iii. 24. Thw. Enum. 194. C. P. 473.

Fl. B. Ind. iii. 573. Burm. Thes. t. 62. Wight, Ill. t. 150.

A small tree, twigs smooth, marked with prominent leaf-scars, young parts glabrous; l. 3–6 in., oval or oval-lanceolate, acute at base, acuminate, acute, shallowly crenate-serrate, glabrous and shining, coriaceous, veins slender, pellucid, petiole $\frac{1}{4}$–$\frac{1}{2}$ in., stout, flat or furrowed above; fl. small, numerous, sessile or nearly so, with 3 small bracts at base, rather laxly arranged in simple or more usually branched, erect, glabrous or puberulous infl. 2–3 in. long; cal. glabrous, limb short, segm. obtuse or rounded; cor. $\frac{1}{4}$ in., tube very short, segm. rounded, concave; stam. 30–40; drupe about $\frac{1}{4}$ in., globose, narrowed above into a cylindrical neck, glabrous, purple, faintly ribbed when dry, stone thin, 3-seeded.

Moist region from sea-level to 7000 ft., very common. Fl. Feb.–May; white, slightly scented.

Also in India, China, Malaya, Japan.

Somewhat variable in form and texture of leaf. DC. (Prod. viii. 254) distinguishes our plant as var. *zeylanica*. Wood light, white, close-grained, but liable to split. A decoction of the bark is used as an external application. The leaves afford a dye.

2. **S. obtusa,** *Wall. Cat. n.* 4424 (1828).

Thw. Enum. 185. C. P. 626.

Fl. B. Ind. iii. 583. Wight, Ic. t. 1233.

---

* From the Sinhalese name; this genus was referred to *Combretaceæ*.

A tree, much branched, bark furrowed, branchlets stout, young parts glabrous; l. small, 2–3½ in., oval- or obovate-oblong, usually narrowed at base, rounded at apex, more or less glandular-denticulate or serrate (especially when young), often recurved at margin, glabrous, stiffly coriaceous, venation pellucid, conspicuous beneath, petiole ¼ in.; fl. rather large, sessile (pedicellate at base of infl.), bracts caducous, spikes very stout, peduncled, 2–3 in., often from axils of fallen l., glabrous; cal.-segm. rounded, ciliate; cor. ⅝ in. diam.; stam. very numerous; drupe ½ in., oblong-ovoid, capped with conspicuous cal.-rim, stone usually 3-seeded.

Var. β, **major,** *Thw.* C. P. 1820.

L. larger, 4–5 in., oblong, shortly acuminate; fl. smaller.

Var. γ, **obovata,** *Thw.* C. P. 1819.

L. smaller, 1–1½ in., broadly obovate or suborbicular, very coriaceous; fl. usually solitary in axils.

Var. δ, **cucullata,** *Thw.* C. P. 2835.

L. crowded, 3–5 in., extremely thick and leathery, obtuse at both ends, very much revolute, petiole very thick and short, purple.

Upper montane zone, common, especially var. β. Fl. March, April, September; white, sweet-scented.

Also in mountains of S. India.

The young leaves are purple. The bracts sometimes become leaves and the infl. is converted into a branch. The lobes of the cor. are often 6, 7, or 8. Var. γ looks very different, and is perhaps distinct as a species.

It has been observed that the stumps or roots left in the ground after forest-land has been cleared are very harmful to the tea-plants afterwards planted in their vicinity.

3. **S. læta,** *Thw. Enum.* 184 (1860).
C. P. 165.
Fl. B. Ind. iii. 584.

A small tree, twigs numerous, slender, young parts glabrous; l. small, 1½–3½ in., lanceolate or oval-lanceolate, acute at base, acuminate, acute, very faintly crenate-serrate or slightly undulate, glabrous, coriaceous, petiole ¼ in., slender; fl. sessile or pedicellate, each with an oblong glabrous quickly deciduous bract; spikes numerous, lax, 2–3 in.; cal. glabrous, segm. ovate, obtuse or subacute; cor. about ½ in. diam., lobes ovate-oblong; drupe ½ in., fusiform-oblong, smooth.

Montane zone, 4000–7000 ft., rather common. N. Eliya; Adam's Peak; Knuckles Mountains; Rangala; Nanu-oya. Fl. March, April; white.

Endemic.

The var. *pedicellata*, Thw. MS. in Hb. Perad., can scarcely be maintained; the flowers are stalked and sessile in the same inflorescence.

4. **S. bractealis,** *Thw. Enum.* 185 (1860).
C. P. 174.
Fl. B. Ind. iii. 584.

A small tree or shrub, young parts glabrous or hirsute; l. small, $1\frac{1}{2}$–3 in., oblong-oval, rounded at both ends, rarely subacute, finely serrate, often revolute at margin, glabrous, stiff and coriaceous, venation much reticulate and prominent, petiole very short, stout; fl. few, nearly sessile, concealed in bud by the very large oval glabrous ciliate bracts; spikes short, $\frac{1}{2}$–$1\frac{1}{2}$ in.; cal. usually glabrous, segm. large, rounded at apex, cor. nearly $\frac{1}{2}$ in. diam.; drupe ovoid-oblong, over $\frac{1}{2}$ in., capped with large erect cal.-segm.

Upper montane zone, rather rare. N. Eliya; Adam's Peak; Horton Plains. Fl. Jan., Feb.; white.

Endemic.

As with many of the trees and shrubs at the higher elevations, the leaves are often strongly revolute at the margins (var. *revoluta*, Wight and Gardn.).

5. **S. versicolor,** *Clarke, Fl. B. Ind.* iii. 584.
S. rufescens, Thw. Enum. 184 (non H.B.K.). C. P. 3639.
Fl. B. Ind. iii. 584.

A small tree, twigs slender, young parts glabrous; l. 2–4 in., oval, tapering to acute base, caudate-acuminate, acute, nearly entire, glabrous, thin; fl. few, nearly sessile, small, bracts small, strongly ciliate, spikes short, 1–$1\frac{1}{4}$ in., slender; cal. glabrous, segm. rounded, finely ciliate; cor. small (not seen expanded); drupe (not ripe) $\frac{1}{2}$ in., linear-oblong.

Moist low region; very rare. Ambagamuwa Dist. (Thwaites); near Hewesse; Pasdun Korale. Fl. Jan.–May; white.

Endemic.

The leaves turn a coppery-orange in drying.

6. **S. acuta,** *Thw. Enum.* 186 (1860).
C. P. 2681.
Fl. B. Ind. iii. 584.

A small tree, young parts with adpressed hair; l. $2\frac{1}{2}$–4 in., lanceolate, acute at base, acuminate, very acute, entire, glabrous above, adpressed-hairy on veins beneath, coriaceous, lat. veins oblique, prominent beneath, petiole over $\frac{1}{4}$ in., flattened; fl. few, on short ped., racemes very short, under 1 in., from axils of upper l., hairy, bracts ovate, hairy, deciduous; cal.-tube very short, hairy, segm. large and deep, oval, obtuse; cor. rather under $\frac{1}{2}$ in. diam.; drupe $\frac{5}{8}$ in., fusiform-oblong, crowned with erect cal.-segm., very slightly hairy.

Moist region; very rare. Palabadala, Sabaragamuwa Dist., at about 2000 ft. Fl. March; cream-coloured.

Endemic.

The flowers are often 4-merous. The remark in Fl. B. Ind. as to confusion with regard to the fruit is incorrect as applied to Thwaites. The fruit described by him is undoubtedly that of *S. acuta*, and there is no confusion with *S. cuneata* in Herb. Perad.

7. **S. cuneata,** *Thw. Enum.* 186 (1860).
C. P. 2920.
Fl. B. Ind. iii. 584.

A tree, twigs densely adpressed-hairy; l. somewhat crowded at end of year's growth, 3–5½ in., lanceolate, attenuate at both ends, very acute, entire but ciliate on margin, glabrous above, densely adpressed-hairy on veins beneath, rather coriaceous, veins impressed above, very prominent beneath, petiole very short, densely hairy; fl. almost sessile, spikes short, ½–1½ in., bracts rounded, silky; cal. densely silky, segm. oval-oblong, obtuse; cor. under ½ in. diam.; drupe ⅝ in., oblong, densely adpressed-hairy, purple.

Moist low country below 1500 ft.; rather rare. Hewesse; Ratnapura; Nillowe Kande; Morowak Korale. Fl. March; pinkish-white.
Endemic.
Very near *S. acuta*, and scarcely to be distinguished by its shorter petioles and l.-veins more strongly impressed on upper surface. Moon collected this, according to Fl. B. Ind.

8. **S. hispidula,** *Thw. Enum.* 186 (1860).
C. P. 407.
Fl. B. Ind. iii. 585.

A tree, branchlets hispid with long spreading hair; l. 3½–5½ in., oblong-ovate or subrotundate, subcordate at base, shortly acuminate, acute, entire, glabrous above, hispid with spreading hair on veins beneath, thin, venation reticulate, prominent beneath, petiole short, hispid; fl. few, pedicellate, raceme usually short, but sometimes reaching 4 in., elongating and drooping in fruit, hairy, bracts long-lanceolate, acute, hairy, persistent; cal.-segm. oval, obtuse, very hairy; cor. ⅓ in. diam.; drupe about ½ in., narrowly ovoid, crowned with enlarged cal.-segm., covered with long spreading hair.

Lower montane zone, 3000–5000 ft.; rare. Ambagamuwa Dist.; Alu-oya, Sabaragamuwa Dist. Fl. March; pinkish-white.
Endemic.

9. **S. jucunda,** *Thw. Enum.* 186 (1860).
C. P. 2435 (3454).
Fl. B. Ind. iii. 585.

A tree, twigs and young parts densely covered with long spreading fulvous tomentum; l. 3–5 in., oblong-lanceolate, rounded at base, tapering to very acute apex, entire or very faintly denticulate-serrate, glabrous above, densely fulvous-

tomentose on veins beneath, membranous or subcoriaceous, veins depressed above, prominent beneath, petiole short, tomentose; fl. sessile or on short ped., spikes 1½–3 in., much fulvous-tomentose, bracts long, lanceolate, very tomentose, caducous; cal. densely tomentose, segm. large, oval, rounded; cor. under ½ in. diam.; drupe ⅝ in., fusiform-oblong, crowned with large spreading cal.-segm., hairy, blue.

Moist region to 4000 ft.; rather rare. Ratnapura; Nillowe Kande; Deltota. Fl. March–May; white.

Endemic.

10. **S. angustata,** *Clarke, Fl. B. Ind.* iii. 585 (1882).

S. elegans, var. *β*, *angustata*, Thw. Enum. 186 (part). C. P. 78 (155).

Fl. B. Ind. iii. 585.

A tree, twigs very slender, young parts adpressed-pubescent; l. small, 1–2½ in., lanceolate, rounded at base, caudate-acuminate, acute, distantly spinous-denticulate, glabrous above, slightly hairy on midrib beneath, thin, venation rather conspicuous beneath, petiole short, slender; fl. few, sessile or on short ped., racemes 1–2 in., very slender, glabrous, bare below, bracts very small, hairy, persistent; cal. usually glabrous, segm. oval, obtuse; cor. ⅜ in. diam.; fruit not seen.

Montane zone; very rare. N. Eliya (Macrae, Fl. B. Ind.); Galagama; Hunasgiriya. Fl. Jan.–May; white.

Endemic.

11. **S. latiflora,** *Clarke, Fl. B. Ind.* iii. 585 (1882).

S. hirsuta, Wight and Gardn. in Thw. Enum. 185 (non A. DC.). C. P. 368.

Fl. B. Ind. iii. 585.

A tree, branchlets rigid, somewhat divaricate, young parts hairy or hispid; l. 2–4 in., oval- or lanceolate-oblong, rounded at base, shortly acuminate, acute, sharply and finely serrate, glabrous above, rough and hispid on veins beneath, thin, petiole short, hispid; fl. nearly sessile or distinctly pedicellate, rather crowded, racemes short, ½–2 in., bracts rounded, very hairy; cal. glabrous, segm. ovate, acute; cor. ½ in. diam.; stam. very numerous; drupe over ½ in., oblong, cylindrical, capped with spreading enlarged cal.-segm. glabrous.

Upper montane zone; rather common. N. Eliya; Dimbula; Adam's Peak; Ambagamuwa; Hunasgiriya; Madulkelle; Knuckles; Rangala; Haputale. Fl. April and September; white.

Endemic.

The Haputale specimens have narrower and more acuminate leaves.

12. **S. elegans,** *Thw. Enum.* 185 (1860) (excl. var. *β*).

C. P. 23.

Fl. B. Ind. iii. 586.

A small tree, branchlets slender, twigs densely orange-tomentose; l. numerous, 1–2½ in., oval or lanceolate, rounded at base, acuminate, acute, entire or very slightly serrulate, often revolute at margin, glabrous above, slightly adpressed-hairy on midrib beneath, thin but stiff, reticulate venation prominent beneath; fl. few, nearly sessile, racemes small, 1–1½ in., very lax and slender, densely fulvous-hairy, bracts linear-lanceolate, soon falling; cal. glabrous, lobes oblong, rounded; cor. ⅜ in. diam.; fruit about ½ in., fusiform-oblong.

Upper montane zone; rather common. Adam's Peak; Dimbula; Gt. Western Mt.; Hakgala; Horton Plains; Knuckles Mt.; Rangala. Fl. April and September; white.

Endemic.

Scarcely distinct from *S. latiflora.* The leaves are frequently strongly revolute or cucullate, as in other montane species.

13. **S. minor,** *Clarke, Fl. B. Ind.* iii. 586.
S. hirsuta, var. *β*, *minor*, Thw. Enum. 185. C. P. 273.
Fl. B. Ind. iii. 586.

A small tree, twigs villous with long hair; l. small, 1–1½ in., broadly oval or subrotund, rounded at base, usually acute, denticulate-serrate, margin usually revolute, glabrous above, bristly on veins beneath, thick and hard, venation reticulate, prominent beneath, petiole nearly ¼ in.; fl. few, racemes short, ½–1 in., bracts caducous; cal. glabrous; cor. under ½ in. diam.; drupe ½–⅝ in., oblong-ovoid, smooth, deep metallic blue.

Var. *β*, **glabrescens,** *Thw. in Fl. B. Ind. l. c.* C. P. 2204.

L. glabrous beneath, margin less recurved; fruit rather smaller.

Upper montane zone; rather rare. Horton Plains; Pedurutalagala; between Ramboda and Maturata. Fl. Feb.–April; white.

Endemic.

Very near *S. latiflora*, with which Thwaites places it. I cannot distinguish var. *eugenioides*, Champ. (Fl. B. Ind.), from var. *glabrescens.* The leaves are often cucullate. C. P. 155 quoted for this in Fl. B. Ind. is *S. angustata* in Hb. Perad.

14. **S. hebantha,** *Thw. in Fl. B. Ind.* iii. 586 (1882).
C. P. 3918.
Fl. B. Ind. iii. 586.

Twigs stout, pubescent; l. large, 4–4½ in., oval or lanceolate-oval, acute at base, acuminate, acute, nearly entire (with a few minute spinous denticulations only), glabrous above, slightly silky on veins beneath, petiole ½–⅝ in., pubescent; fl. very shortly stalked, numerous, spikes many, 1½–2 in., stout, densely velvety-pubescent, bracts broad, deciduous densely

pubescent; cal.-tube glabrous, segm. oval, subacute, strongly pubescent; cor. $\frac{1}{2}$ in. diam.; fruit not seen.

Moist low country; very rare. Gongala, Kolonna Korale (Thwaites). Fl. July.

Endemic.

I have seen the C. P. specimens only, collected in 1866–8; they are in advanced bud, with a few open fl.

15. **S. cordifolia,** *Thw. Enum.* 187 (1860).
C. P. 271.
Fl. B. Ind. iii. 586.

A tree, branchlets very stout, marked with prominent leaf-scars, young parts puberulous becoming glabrous; l. large, 4–6 in., nearly sessile, crowded together at end of year's growth, oblong-oval, auriculate-cordate at base, subacute or rounded at apex, sharply spinous-denticulate, usually with recurved margins, glabrous on both sides, very coriaceous, venation prominent beneath; fl. sessile, rather crowded, spikes numerous, $2\frac{1}{2}$–$3\frac{1}{2}$ in., erect, stout, densely tomentose, bracts large, oval, densely villous; cal.-tube glabrous, segm. lanceolate, densely tomentose; cor. large, $\frac{5}{8}$ in. diam., stam. very numerous; drupe $\frac{1}{2}$–$\frac{3}{4}$ in., oblong, cylindrical, capped with large erect cal.-limb, glabrous but rough.

Upper montane zone, 6000–7000 ft.; rare. N. Eliya; Maturata; Wattekelle Mt.; Rangala. Fl. Sept.; pink.

Endemic.

This is the only Ceylon species with pink petals. The Rangala plant has larger, nearly entire l., and connects this with var. β of *S. apicalis.*

16. **S. apicalis,** *Thw. Enum.* 187 (1860).
C. P. 438.
Fl. B. Ind. iii. 586.

A small tree, branchlets strigose; l. crowded at upper end of year's growth, large, 6–10 in., lanceolate, acute at base, shortly acuminate, acute, very nearly entire, glabrous above, strigose on veins beneath, thin, venation prominent beneath, petiole $\frac{1}{4}$–$\frac{1}{2}$ in., stout, strigose; fl. few, sessile, spikes very short, from axils of bud-scales below the leaves, bracts very hairy; cal.-tube hairy; cor. over $\frac{1}{2}$ in. diam.; drupe $\frac{5}{8}$ in., ovate-oblong, glabrous or slightly hairy.

Var. β, **glabrifolia,** *Thw. l. c.* C. P. 2933.

Branchlets glabrous, l. larger often 12 or 15 in., somewhat spathulate, much tapering to base and there narrowly cordate, glabrous on both sides, coriaceous; spikes longer arising from l.-axils and appearing terminal; drupe large, more hairy, pale purple.

Moist low country below 1000 ft.; rare. Kudalugama, Reigam Korale. Var. β, Singhe Raja Forest; Pasdun Korale. Fl. April, Sept.; purplish-white.

Endemic.

Var. β should, perhaps, rather be placed as a low-country variety under *S. cordifolia.*

17. **S. marginalis,** *Thw. Enum.* 187 (1860).
C. P. 2688.
Fl. B. Ind. iii. 587.

A tree, branchlets very stout and with the young parts densely velvety with close ferrugineous tomentum; l. 4–7 in., chiefly at end of year's growth, oval, acute or subacute at base, very shortly acuminate, entire but margin thickened and often recurved, glabrous above, densely velvety with ferrugineous tomentum beneath, veins prominent beneath, petiole $\frac{1}{2}$ in., stout, tomentose; fl. sessile, spikes short, $1\frac{1}{2}$–2 in., from the l.-axils, velvety, bracts oval, deciduous; cal. densely velvety; cor. $\frac{3}{8}$ in. diam., drupe (not ripe) ovate-oblong, densely villous.

Moist low country; rare. Ambagamuwa Dist.; Wallankanda Forest, Pasdun Korale; Kotapolla, South Prov. Fl. March.

Endemic.

A beautiful species, very distinct in foliage.

18. **S. coronata,** *Thw. Enum.* 187 (1860).
C. P. 127.
Fl. B. Ind. iii. 587.

A moderate-sized tree, branchlets very stout, with prominent scars of l. and infl., rough with fulvous hair, buds very large, with numerous ovate, acute, pubescent scales, the innermost ones somewhat leaf-like; l. few, crowded at end of year's growth, on very short stout petioles, large, 6–12 in., oblong-oval, narrowed to base which is usually rounded or subcordate, shortly acuminate, acute, finely denticulate, glabrous, shining and pale bright green above, paler and rufous-pubescent on the very prominent venation beneath, stiff and subcoriaceous; fl. sessile, numerous, spikes rather dense, about $2\frac{1}{2}$ in., from the axils of the fallen bud-scales below the l., bracts rounded, hairy, persistent; cal. densely pubescent, segm. oblong-oval; cor. nearly $\frac{1}{2}$ in.; drupe under $\frac{1}{2}$ in., ovate-ovoid, pubescent.

Moist region 2000–4000 ft.; rather common. Hantane; Knuckles. Fl. Nov., Dec.; pinkish-white.

Endemic.

19. **S. pauciflora,** *Wight in Fl. B. Ind.* iii. 587 (1882).
S. pendula, Thw. Enum. 184 (? Wight). C. P. 504.
Fl. B. Ind. iii. 587.

A shrub or small tree, young parts glabrous; l. rather small, 1½–3 in., obovate-oval, acute or rounded at base, very obtuse and rounded at apex, entire, margin often recurved, glabrous, coriaceous, paler beneath with slightly prominent veins, petiole short; fl. usually solitary but sometimes as many as 5 in a raceme, on slender, curved, glabrous ped., ¼–⅜ in. long from axils of present and fallen l., bracts very small, persistent; cal. glabrous, segm. very short, broadly triangular, ciliolate; cor. about ½ in. diam., tube nearly as long as lobes; stam. very numerous, fil. adnate to cor.-tube, flat, suddenly narrowed below the anth.; drupe (immature) oblong, cylindrical.

Upper montane zone; common. Fl. all the year; pink or cream-coloured.

Endemic.

A very pretty shrub when in flower. I follow the Fl. B. Ind. in keeping this distinct from the Nilgiri *S. pendula*, to which Thwaites (I think rightly) referred it. Wight's figure, Ic. t. 1237, very well represents one form of our plant, which varies considerably in inflorescence; the pedicels often droop in the bud-stage.

LXXXII.—OLEACEÆ.

TREES or shrubs, sometimes climbing, l. opp., simple or (rarely) compound; fl. regular, bisexual (rarely unisexual and polygamous), in cymes; cal. free, segm. 4 (or 5 or more); cor. with short or long tube or cut almost into separate pet., lobes (or pet.) 4 (or 5–11), imbricate or valvate; stam. 2, inserted on base of cor., fil. short; ov. superior, 2-celled with 2 (or 1) ovules in each cell, style simple, stigmas bilobed or 2; fruit either of 2 pulpy carp. or a drupe with a woody or crustaceous stone; seed solitary (or 2) with or without endosperm.

Fruit of two berry-like carp.; cor.-lobes 5–11 (*Jasmineæ*) 1. JASMINUM.
Fruit a drupe; cor.-lobes 4 (*Oleineæ*).
  Cor.-segm. or pet. linear; infl. axillary . . . 2. LINOCIERA.
  Cor.-segm. oval.
    Style very short; infl. axillary or terminal . . 3. OLEA.
    Style of moderate length; infl. terminal . . . 4. LIGUSTRUM.

We have 12 species of this Family, of which one—*Linociera purpurea*—is endemic. Three species of *Jasminum* are confined to the dry region, and one to the Hills, where only are also found *Linociera leprocarpa*, *Ligustrum*, and *Olea polygama*.

1. JASMINUM, *L.*

Shrubs, usually scandent by their horizontal slightly twining branches, l. opp., simple or compound, without stip.; fl. rather large, in terminal (rarely axillary) cymes; cal. shortly tubular or funnel-shaped, segm. usually 5 (rarely more) narrow; cor.-tube long, usually narrow, lobes 5–11, spreading, imbricate; stam. 2, inserted and included in cor.-tube, fil. very short, anth. oblong; ov. superior, 2-celled, with 1 or 2 erect ovules in each cell, style simple, stigmas 2; fruit didymous, of 2 berry-like carp. (one often undeveloped); seed solitary or 2 in each carp., no endosperm.—Sp. 90; 43 in *Fl. B. Ind.*

L. simple (see also 4).
  Cal. pubescent . . . . 1. J. GLABRIUSCULUM.
  Cal. glabrous.
    Cal.-segm. long, over $\frac{1}{3}$ in. . . . . . 2. J. SESSILIFLORUM.
    Cal.-segm. short, under $\frac{1}{6}$ in. . . . 3. J. ANGUSTIFOLIUM.
L. compound.
  L. trifoliolate; fl. white.
    Lat. lflts. very small . . . . . . 4. J. AURICULATUM.
    Lflts. nearly equal. . . . . . 5. J. FLEXILE.
  L. pinnate; fl. yellow . . . . . . 6. J. HUMILE.

J. Sambac, Ait. (*Nyctanthes Sambac*, L.) is an old inhabitant of gardens, and is included in Hermann's collection (with double flowers), Fl. Zeyl. n. 12. It is also figured in Burm. Thes. t. 58, f. 2, but is nowhere wild here. It is called 'Pichcha' and 'Géta-pichcha' by the Sinhalese, and 'Arabian Jasmine' by the English. It is C. P. 1812.

[*J. pubescens*, Willd., is given for Ceylon in Fl. B. Ind. It is a common garden plant, but has no claim to be considered a native.]

1. **J. glabriusculum,** *Bl. Bijdr.* 679 (1825).
Thw. Enum. 424 and (*J. rigidum*) 190. C. P. 1809.
Fl. B. Ind. iii. 593 (*J. Rottlerianum*, var. *Thwaitesii*, Clarke).

Stems quite glabrous or young parts slightly pubescent; l. simple, $1\frac{1}{2}$–3 in., oval, rounded or subcordate at base, mucronate at apex, glabrous or with a few scattered hairs on the veins beneath, petiole short, curved, glabrous; fl. on very short ped., in threes, cymes small, dense, corymbose, bracts oval, glabrous or finely pubescent; cal. usually finely pubescent, segm. $\frac{1}{8}$–$\frac{1}{6}$ in., longer than tube, linear-filiform; cor.-tube $\frac{3}{4}$–1 in., slightly dilated above, lobes 5–8, usually 7, linear or lanceolate-linear, half as long as tube; ripe carp. $\frac{3}{8}$ in., globose.

Dry region; common. Fl. April–Aug.; white.
Also in the Nilgiris (Fl. B. Ind.).
I follow Thwaites in referring this common dry-country Jasmine to

J. glabriusculum, Bl. Clarke places it as a variety under *J. Rottlerianum*, Wall., which is a very hairy plant (Wight, Ic. t. 1249).

[*J. arborescens*, Roxb., is given for Ceylon in Fl. B. Ind. iii. 594, but I am not aware on what evidence.]

J. laurifolium, Roxb., is occasionally cultivated, and has escaped in a few places in the hills, as at Haputale, where it looks wild.

2. **J. sessiliflorum,** *Vahl, Enum. Pl.* i. 29 (1805).
C. P. 1807 (part).
Fl. B. Ind. iii. 597.

Stems glabrous, l. simple, small, $\frac{1}{2}$–$1\frac{1}{2}$ in., narrowly ovate-oblong, subacute or rounded at base, acute, mucronate, glabrous; fl. on glabrous ped., cymes small, lax, terminal; cal. glabrous, segm. $\frac{3}{8}$–$\frac{1}{2}$ in. long, filiform, glabrous; cor.-tube about $\frac{3}{8}$ in., lobes 8–11 (often 9), slightly longer than tube, narrowly linear; ripe carp. small, $\frac{1}{4}$ in., ovoid-globose.

Dry country; apparently very rare. Trincomalie (Glenie). Fl. white. Also in S. India.

These specimens were included by Thwaites under *J. angustifolium*; I have seen no others.

3. **J. angustifolium,** *Vahl, Enum. Pl.* i. 29 (1805). **Wal-pichcha,** *S.*
Moon Cat. 2. Thw. Enum. 190. C. P. 1807.
Fl. B. Ind. iii. 598. Wight, Ic. t. 698.

Stems glabrous, twigs pubescent; l. simple, numerous, very variable even on the same plant, small, usually $\frac{1}{2}$–2 in. but sometimes attaining $3\frac{1}{2}$ in., ovate-oval or oval-lanceolate, rounded at base, sometimes attenuate, obtuse or acute at apex, glabrous; fl. on long slender ped., solitary or more usually in threes at ends of short lateral divaricate twigs; cal. glabrous, segm. distant, short, $\frac{1}{8}$–$\frac{1}{6}$ in., filiform, acute; cor.-tube about $\frac{5}{8}$ in., lobes 7 or 8, equalling the tube, linear-oblong, very acute, ripe carp. about $\frac{1}{3}$ in., broadly ovoid, both usually developed.

Low country up to over 2000 ft.; common, especially in the dry region. Fl. April, July-Sept.; white.

Also in the Indian Peninsula.

A variable plant in foliage and size of flowers.

J. Ritchiei, Clarke, var. *purpurea*, is given in Fl. B. Ind. for Ceylon on the faith of a specimen labelled by Wight in Herb. Kew. It is distinguished from *angustifolium* only by its perfectly globose fruit, and is found in the hills of S. India.

[*J. rigidum*, Zenk., is also given for Ceylon in Fl. B. Ind. It is a species of S. India figured in Wight, Ic. t. 1247. I know of no Ceylon specimens.]

4. **J. auriculatum,** *Vahl, Symb. Bot.* iii. 1 (1794).
Moon Cat. 3. Thw. Enum. 190. C. P. 1810.
Fl. B. Ind. iii. 600. Wight, Ic. t. 700, 1255 (*J. affine*) and 1256 (*J. ovalifolium.*

Branches usually more or less pubescent, sometimes velvety; l. 3-foliolate the two lat. lflts. very small (often wanting), the central one 1–2 in., broadly ovate-oval, rounded at base, obtuse or acute, mucronate at apex, glabrous or more or less pubescent on both sides; fl. small, numerous on rather long ped., cymes lax, corymbose, pubescent (occasionally axillary), bracts small, linear; cal. pubescent, segm. very short, triangular-oblong; cor.-tube $\frac{1}{4}$–$\frac{3}{8}$ in., lobes 5–7, shorter than tube, oval-oblong, acute; ripe carp. under $\frac{1}{4}$ in., globose.

Dry region; common. Fl. July–December; white.
Also in Peninsular India.
The two small lateral leaflets are very often absent, and the leaves then appear simple.

5. **J. flexile,** *Vahl, Symb. Bot.* iii. 1 (1794).
Thw. Enum. 190. C. P. 724.
Fl. B. Ind. iii. 601. Wight, Ic. t. 1253.

Stems very long, climbing tall trees, quite glabrous, twining when young; l. 3-foliolate, petiole 1 in., at first flexuose, afterwards stiffly divaricate or reflexed, thickened at top, lflts. stalked, rather large, $2\frac{1}{2}$–$4\frac{1}{2}$ in., oblong-lanceolate, rounded at base, acuminate, acute, glabrous, somewhat undulate, the middle one rather the longest; fl. large, on short ped., cymes copious, large, lax, paniculate, axillary, bracts very small, linear; cal. glabrous, segm. tooth-like, distant; cor.-tube nearly 1 in., lobes usually 5, $\frac{1}{2}$–$\frac{3}{4}$ in., oval or lanceolate, acute or obtuse; ripe carp. on a thick stalk (gynophore), $\frac{5}{8}$ in., broadly ovoid, dark purple.

Moist and intermediate regions, and extending into lower montane zone; rather common. Hantane; Ambagamuwa; Hunasgiriya; Kurunegala; Pelmadulla; Nitre Cave Dist.; near Hakgala at 5000 ft. Fl. July–Dec.; very sweet-scented.
Also in India.
A beautiful and extensive creeper. The leaves dry yellow. When growing at the higher elevations the l. are often broader and coriaceous. Thwaites and Clarke both quote for this Burm. Thes. t. 58, f. 1 (*J. Burmannianum*, Bl.), which is Fl. Zeyl. n. 13 = *J. azoricum*, L. There is, unfortunately, no specimen in Hermann's Herb., but his figure and brief description point rather to that common garden plant than to *J. flexile.*

6. **J. humile,** *L. Sp. Pl.* 7 (1753).
Thw. Enum. 190. C. P. 1811.
Fl. B. Ind. iii. 602. Wight, Ic. t. 1258 (*J. revolutum*). Bot. Reg. t. 1409 (*J. Wallichianum*).

A small erect shrub, branchlets angular, glabrous; l. pinnate, rachis 1–1½ in., lflts. 5 (2 pair and an end one), lanceolate-oval, obscurely stalked, acute at both ends, narrowly reflexed on margin, glabrous; fl. rather large, 1–3 together, terminal or leaf-opposed, ped. ¾ in., drooping, thickened below fl.; cal. glabrous, segm. short, triangular, acute; cor. about 1 in., tube funnel-shaped, lobes 5, short, recurved, rotundate; ripe carp. ⅝ in., nearly globose, pulpy.

Upper montane zone; very rare. Elephant Plains (Gardner); Kandapola (Nock); Horton Plains. Fl. May; yellow.

Also in the Himalayas and Nilgiris.

The Fl. B. Ind. makes this 'common' in Ceylon as well as in S. India, but it is very local here. Well known in Europe as a hardy garden shrub.

[*Nyctanthes Arbor-tristis*, L., is cultivated and well known as 'Sépala' or 'Sépalika,' and was collected by Hermann and Grimm. It is Fl. Zeyl. n. 11 and C. P. 1808, but is not native here. One of the dyes for the Buddhist monks' yellow robes is obtained from the flowers.]

2. **LINOCIERA,** *Sw.*

Trees or shrubs, l. opp., entire, fl. small in paniculate or racemose axillary cymes; cal. small, segm. 4; cor. split almost or quite to base into 4 linear lobes or pet., induplicate-valvate in bud; stam. 2, inserted at very base of cor., fil. very short; ov. 2-celled, with 2 pendulous ovules in each cell, stigma bilobed; fruit a drupe with a woody or crustaceous endocarp; seed usually solitary, without endosperm.—Sp. 40; 11 in *Fl. B. Ind.*

Cymes paniculate . . . . 1. L. PURPUREA.
Cymes simply racemose.
  Fruit smooth . . . . 2. L. ALBIDIFLORA.
  Fruit rough . . . . 3. L. LEPROCARPA.

1. **L. purpurea,** *Vahl, Enum.* i. 47 (1805). **Geriata,** *S.* **Kattimuruchan,** *T.*

Herm. Mus. 23. Fl. Zeyl. n. 14. *Chionanthus zeylanica*, L. Sp. Pl. 8. Moon Cat. 3. Thw. Enum. 188. *Thouinia nutans*, L. f. Suppl. Pl 89. *Chionanthus purpurea*, Lam. Ill. i. 30. C. P. 1818.
Fl. B. Ind. iii. 608.

A small tree, bark white or grey, smooth, twigs slender, lenticellate, young parts glabrous; l. 2–3 in., obovate-oval, much tapering to base, rounded or very shortly and bluntly acuminate at apex, glabrous, coriaceous, venation very inconspicuous; fl. numerous, usually on short ped., in lax glabrous paniculate cymes 1½–3 in. long; cal. glabrous, segm. rounded,

ciliate; cor. divided almost to base, lobes or pet. $\frac{1}{6}$ in., linear; drupe about $\frac{1}{4}$ in., obovate-ovoid, apiculate.

Dry and intermediate regions; very common, but scarcely extending into the moist region. Fl. March, Sept., Oct.; white.

Endemic.

The Fl. B. Ind. gives a var. *dichotoma* from Ceylon only, but the *Chionanthus dichotoma* of Roxburgh was from Coromandel. *Chionanthus Ghœri*, Gaertn. Fruct. i. 190, t. 39, from Ceylon, is indeterminable.

[*L. cotinifolia*, Willd. (*Chionanthus zeylanica*, Lam., non L.) is based wholly on the imperfect figure of Plukenet (Phytogr. t. 241, f. 4), made from a specimen said to have been brought from Ceylon by Tancred Robinson. Moon (Cat. 3) also includes it, and gives the locality Kalutara and a native name 'Hin-geriata.' But the specimens in Plukenet's herbarium (in British Museum) prove to be the American *Chionanthus virginicus*, L., and the statement that they came from Ceylon was, doubtless, an error (see Britten in Journ. Bot. xxxii. 38.)]

2. **L. albidiflora,** *Clarke, Fl. B. Ind.* iii. 608 (1882).
Chionanthus albidiflora, Thw. Enum. 189. C. P. 472.
Fl. B. Ind. iii. 608.

A large bush or small tree, bark smooth, whitish, young parts glabrous; l. 3–5 in. (occasionally larger), oval or oblong-oval, on very short petioles, tapering to base, caudate-acuminate, obtuse, glabrous, paler beneath, rather thick; fl. few, on very short ped., in opp. pairs on short racemose cymes $\frac{3}{4}$–$1\frac{1}{2}$ in. long from axils of present and fallen l., bracts small, pilose, caducous; cal. glabrous, segm. shallow, rounded; cor. split quite to base on two sides, but adjacent lobes connate at base into 2 pairs, lobes or pet. about $\frac{3}{4}$ in., linear, with involute edges so as to be deeply channelled along upper surface, spreading; stam. very small; ov. conical, style 0; drupe a little over $\frac{1}{2}$ in., obovate-ovoid, minutely apiculate, somewhat truncate at base, smooth, dull bluish-purple, pulp juicy, scanty, stone thin, with 8 obscure vertical ribs.

Var. β, **rostrata,** *Clarke, l. c. Chionanthus rostrata*, Thw. l. c. C. P. 3472.

Cal.-segm. ciliate; fruit over 1 in., fusiform-oblong, bluntly pointed.

Low country, rather common, up to 3000 ft. Kitulgala; Hewaheta: Balangoda; Galagama; Nilgala; Batticaloa Dist.; Doluwa Kande, Kurunegala Dist. Var. β, moist region only, rare. Hiniduma; Karawita. Fl. Sept.–March; yellowish-white.

Also in Australia (Queensland).

3. **L. leprocarpa,** *Clarke, Fl. B. Ind.* iii. 608 (1882).
Chionanthus leprocarpa, Thw. Enum. 189. C. P. 2475.
Fl. B. Ind. iii. 608.

A moderate-sized tree; l. 3½–4½ in., oblong-lanceolate, tapering to base, long-acuminate, subacute, glabrous, subcoriaceous, lat. veins few, nearly horizontal, faintly marked, petiole very short, stout; fl. on short ped., few, in puberulous racemose cymes about 1 in. long, bracts very small, cal. glabrous, segm. rounded, ciliate; drupe 1 in., ovoid or subpyriform, rough with small scales, brownish-purple.

Lower montane zone, rare, 3000–4000 ft. Deltota; Raxawa; Hunasgiriya. Fl. March; white.

Also in S. India; if *L. courtallensis*, Bedd., be the same.

I have seen only the C. P. specimens, which are in bud with some loose fruit. An obscure species.

3. OLEA, *L.*

Trees, l. opp., entire or very nearly so, fl. small, sometimes unisexual, in axillary and terminal panicles; cal. small, segm. 4; cor. 4-lobed; stam. 2, inserted at base of cor.-tube; ov. 2-celled with 2 ovules in each cell, style very short, stigma bilobed; drupe ovoid, endocarp thin, crustaceous; seed solitary with copious fleshy endosperm.—Sp. 35; 7 in *Fl. B. Ind.*

Fl. all bisexual; cor. cut nearly to base . 1. O. GLANDULIFERA.
Fl. polygamous; cor. cut half way down . 2. O. POLYGAMA.

1. **O. glandulifera,** *Wall. Cat.* n. 2811 (1828).
Thw. Enum. 188. C. P. 2481.
Fl. B. Ind. iii. 612 (not given for Ceylon). Wight, Ic. t. 1238. Bedd. Fl. Sylv. t. 238.

A moderate-sized tree, bark grey, young parts glabrous; l. 3–4½ in., oval or lanceolate, tapering to base, caudate-acuminate, acute, entire, glabrous, lat. veins curved, uniting within the edge, with shallow ciliate glandular pits in their axils, petiole about ½ in., channelled above; fl. all bisexual, numerous, on slender ped., in rather large, lax, glabrous, spreading panicles which are terminal and from upper l.-axils, buds globose, bracts small, deciduous; cal. shallow, nearly glabrous, segm. triangular, acute; cor.-tube very short, lobes much longer than tube, ovate, acute; ov. glabrous, stigma large, bifid, drupe ½ in., ovoid, bluntly pointed.

Moist region, 2000–5000 ft., rare. Hanguranketa; Palagama. Fl. April–July; cream-coloured.

Also in the Himalayas and Nilgiris.

This has the inflorescence of *Ligustrum*, and might be equally well placed in that genus.

2. **O. polygama,** Wight, Ic. iv. pt. i. 11 (1850).
O. Gardneri, Thw. Enum. 188. C. P. 275.
Fl. B. Ind. iii. 613. Wight, Ic. tt. 1239, 1240.

A small tree, bark whitish-brown, young parts glabrous; l. crowded at end of year's growth, rather small, 1½–2½ in., oval, acute at both ends (rarely obtusely acuminate), entire (or faintly serrate near apex), margin usually narrowly recurved, glabrous, stiff and coriaceous, venation depressed above, rather prominent beneath, lat. veins few, nearly horizontal, connected by an intramarginal one, petiole ¼ in., stout; fl. polygamous (male and bisexual), numerous, on short ped., in small racemose clusters of 2–7, on branches of long-stalked axillary panicles coming off from the young branchlets below the l.; cal. very small, segm. triangular, faintly ciliate; cor. campanulate, lobes as long as the tube, oval, obtuse; drupe ⅜–½ in., ovoid, endocarp thin.

Montane zone, 4000 ft. upwards, common, especially in the N.-East Mountain block. Fl. Sept.–Oct. and May; white.

Also in the Nilgiris.

4. **LIGUSTRUM,** *L.*

Bush or small tree, l. opp., entire; fl. bisexual, numerous, in terminal panicles; cal. small, segm. 4; cor.-tube short, lobes 4; stam. 2, inserted at throat of cor.; ov. 2-celled, with 2 ovules in each cell, style moderately long, stigma clavate; drupe ovoid, 1- or 2-seeded; seed with copious fleshy endosperm.—Sp. 25; 11 in *Fl. B. Ind.*

Scarcely distinct from *Olea.*

L. Walkeri, *Dcne., Nouv. Arch. Mus., ser.* 2, ii. 27 (1879).

L. robustum, Thw. Enum. 188 (? Bl.). *L. zeylanicum*, Dcne. l. c. 30. C. P. 475.

Fl. B. Ind. iii. 614.

A shrub or small tree, branchlets with copious white lenticels, young parts glabrous; l. 1½–3 in., oval or lanceolate, acute at base, tapering to very acute apex, entire, glabrous, often somewhat conduplicate, thin, lat. veins obscure, petiole short; fl. very numerous, pedicellate, in clusters on the divaricate branches of large, pubescent pyramidal erect terminal panicles 4–6 in. long; cal. campanulate, lobes very shallow and broad; cor.-lobes oblong oval, subacute; stam. exserted; drupe about ¼ in., ovoid, purple.

Lower montane zone, 3000–5000 ft., rather rare. Haputale and Badulla Districts abundant. Fl. Feb.–June; white, sweet-scented.

Also in the Nilgiris.

Closely allied to *L. robustum*, Bl. of the Malay Peninsula, Burma, and E. Bengal, and perhaps merely a variety of it.

LXXXIII.—SALVADORACEÆ.

TREES or shrubs, l. opp., entire, simple, without stip.; fl. small, regular (or nearly so), bisexual or unisexual and diœcious; cal. free, segm. 4, equal or unequal, cor. 4-lobed or divided into 4 distinct pet., imbricate; stam. 4, inserted on cor.-tube or hypogynous, ov. superior, 1- or 2-celled, with 1 or 2 erect ovules in each cell; fruit a drupe, with a crustaceous or membranous endocarp, seed solitary (or 2), without endosperm.

A very small Tropical Family.

Cor. gamopetalous; ov. 1-celled . . . 1. SALVADORA.
Cor. of four distinct pet.; ov. 2-celled . . 2. AZIMA.

Both are dry-country plants.

1. SALVADORA,* *L.*

A small tree, l. opp., entire, without stip.; fl. small, bisexual, in axillary and terminal racemes or panicles; cal. campanulate, segm. 4; cor. deeply cut, lobes 4, imbricate in bud; stam. 4, inserted in cor.-tube; ov. superior, 1-celled, with 1 erect basal ovule, style 0; fruit a drupe, endocarp crustaceous; seed solitary, globose, without endosperm.—Sp. 2; 1 in *Fl. B. Ind.*

S. persica, *L. Sp. Pl.* 122 (1753). **Uvay, Viyay,** *T.*
S. Wightiana, Planch. in Thw. Enum. 190. C. P. 2267.
Fl. B. Ind. iii. 619. Wight, Ill. t. 181 (*S. indica*). Bedd. Fl. Sylv. t. 247 (*S. Wightiana*).

A small, much-branched, erect tree, with long drooping slender branchlets, bark rough and furrowed, young parts quite glabrous; l. numerous, 1½–2 in., oblong-oval or ovate, tapering or rounded at base, obtuse or rounded, usually mucronate at apex, entire, glabrous and shining on both sides, thick, glaucous green, lat. veins oblique, obscure, petiole ¼–½ in.; fl. small, very numerous, on slender, opp., spreading ped., laxly arranged on branches of spreading, divaricate, glabrous racemes or panicles about as long as l. (or longer when in fruit), terminal and from axils of upper l., cal. small, glabrous, segm. broad, truncate; cor. persistent, lobes oval,

* Commemorates J. Salvador, a Spanish botanist.

acute, reflexed; stam. exserted; drupe $\frac{1}{8}$ in., globose, smooth, red.

Desert and dry regions, especially by the coast, common. Fl. all the year; greenish-white.

Also in dry districts of S. India, Punjab, Scinde, Arabia, Abyssinia, Syria, N. Africa.

Apparently first collected here by Gardner, who (in his Report on the Botanic Gardens for 1845–6, p. 3), remarks on the large trees he observed at Elephant Pass, Jaffna. It is very common about Hambantota.

The small berries and the leaves have the peculiar hot flavour of the *Cruciferæ.* The plant is considered to be the 'mustard-tree' of the Scriptures, and is well known now by that name; it has somewhat the habit of a 'weeping willow.' The fruits are eaten and also given as a medicine to children.

2. **AZIMA,** *Lam.*

A very rigid spiny bush, l. opp., entire; fl. small, unisexual, diœcious, axillary; cal. campanulate, segm. 4, unequal; cor. completely divided into 4 pet., imbricate in bud; male fl.:—stam. 4, alt. with pet., hypogynous; fem. fl.:—ov. 2-celled with 1 or 2 erect ovules in each cell, stigma large, 2-lobed; drupe globose, endocarp membranous; seeds 1 or 2, without endosperm.—Sp. 3 or 4; 2 in *Fl. B. Ind.*

A. tetracantha, *Lam. Encycl. Meth.* i. 343 (1783). **Iyanku, Ichanku,** *T.*

Monetia barlerioides, L'Her., Moon Cat. 11. Thw. Enum. 191. C. P. 2216.

Fl. B. Ind. iii. 620. Wight, Ill. t. 152.

A dense low bush, woody below only, with many opp., divaricate, bluntly quadrangular, green branches, younger ones pubescent; l. on main stems 1–2$\frac{1}{2}$ in., on flowering twigs smaller, oval, acute at both ends, sharply mucronate at apex, entire, glabrous, shining, rather thick, stiff, petiole very short, with 2 very sharp divaricate spines in its axil (so that there are 4 at each node) which are often 1 in. long; fl. sessile, male in small crowded fascicles, female solitary, bracts small, linear, leafy, mucronate; cal. pubescent, segm. obtuse; pet. linear-lanceolate, acute, spreading; ov. glabrous, stigma nearly sessile; drupe $\frac{1}{4}$ in., globose, glabrous, white.

Dry and desert regions, very common. Fl. all the year; greenish-white or yellowish.

Also in S. India, Madagascar, and S. Africa.

Moon gives a Sinhalese name, 'Katu-niyada,' for this, and I have also 'Wel-dehi' for it. The aspect of the plant when in flower is somewhat Amarantaceous, but the general appearance is rather *Citrus*-like.

The spines appear to be the modified lowest pair of l. of suppressed branchlets. The stem-leaves are often suppressed on the flowering shoots, so that the infl. appears as an interrupted spike of whorls, but the axillary spines, much reduced in size, usually remain. I am not aware whether it has any medicinal uses in Ceylon.

LXXXIV.—APOCYNACEÆ.

TREES, shrubs (often climbing), or rarely herbs, l. opp. (whorled in *Alstonia* and *Ochrosia*, alt. in *Cerbera*), entire, without stip.; fl. large or small, regular, bisexual; cal. free, often with glands or scales at the base within, small, segm. 5; cor. salver-shaped with a long tube or rotate with a short one, rarely funnel-shaped, lobes 5 (rarely 6), contorted, overlapping to left or to right; stam. 5, inserted in tube or throat of cor., anth. distinct (rarely connate) but often connivent, either free or adnate to stigma, longitudinally dehiscent, pollen ordinary, granular; disk when present annular; ov. superior, usually of 2 distinct carp., rarely 1-celled, with parietal placentas or 2-celled, with few or numerous ovules, style 1, simple, often much thickened at summit, stigma bifid; fruit usually of 2 dehiscent follicles, more rarely indehiscent and fleshy (in *Alyxia* moniliform); seeds 1, 2 or numerous, with or without a coma of long hair at one end (at both in *Alstonia*), with or without endosperm.

Ov. syncarpous (*Carisseæ*) (see also 12–14).
  Ov. 1-celled; fruit large, globose . . . 1. WILLUGHBEIA.
  Ov. 2-celled; fruit small, ovoid . . . . 2. CARISSA.
Ov. of 2 distinct carp.
  Anth. free from stigma (*Plumerieæ*).
    Fruit-carp. indehiscent, 1–2-seeded.
      Carp. pulpy, 1-seeded; l. whorled . . 3. RAUVOLFIA.
      Carp. moniliform with 1-seeded joints . 4. ALYXIA.
      Carp. usually 2-seeded.
        Fruit fleshy; l. opp. . . . . . 5. HUNTERIA.
        Fruit fibrous-woody; l. alt. . . . . 6. CERBERA.
      Carp. spongy-woody, 1-seeded; l. whorled 7. OCHROSIA.
    Fruit-carp dehiscent (follicles), many-seeded.
      L. opposite.
        Herb; seeds without a coma . . . 8. VINCA.
        Tree; seeds comose . . . . . 9. HOLARRHENA.
        Tree; seeds without a coma . . . 10. TABERNÆMONTANA.
      L. whorled, seeds with hair at both ends 11. ALSTONIA.

Anth. adherent to top of stigma; fruit of 2 follicles (*Echitideæ*).
- Anth. exserted; carp. usually connate.
  - Fil. of stam. long, spirally twisted . . . 12. PARSONSIA.
  - Fil. of stam. short, straight.
    - Cor. without scales . . . . 13. VALLARIS.
    - Cor. with corona of scales . . . 14. WRIGHTIA.
- Anth. included; carp. distinct.
  - Cor. very large. . . . . . . 15. CHONEMORPHA.
  - Cor. small or medium-sized.
    - Cal.-segm. as long as cor.-lobes . . 16. AGANOSMA.
    - Cal.-segm. very short.
      - Cor.-lobes ovate, short . . . 17. BAISSEA.
      - Cor.-lobes linear, long.
        - Follicles stout, tapering . . 18. ANODENDRON.
        - Follicles slender, cylindrical. . 19. ICHNOCARPUS.

The whole of our 25 species are found in the low country, with the exception of *Rauvolfia densiflora*. *Willughbeia* and *Baissea* also extend upwards into the lower montane zone. *Alyxia*, *Hunteria*, *Ochrosia*, *Tabernæmontana*, *Wrightia zeylanica*, *Chonemorpha*, and *Anodendron rhinosporum*, are restricted to the wet, and *Vinca*, *Wrightia flavido-rosea*, and *W. angustifolia* to the dry or intermediate regions. There are 9 endemic species.

1. **WILLUGHBEIA,** *Roxb.* (? *Schreb.*).

Shrub, climbing by hooked leafless branchlets, fl. rather small, in axillary paniculate cymes; cal. small, segm. 5, rounded; cor.-tube inflated, lobes 5, about as long as tube, very slightly overlapping to left; stam. 5, included in cor.-tube, distinct, fil. short; ov. 1-celled with numerous ovules on 2 parietal placentas, style short, stigma large, conical; fruit very large, globose, fleshy, indehiscent, with numerous seeds imbedded in pulp; seed large, cotyledons thick, plane-convex, without endosperm.—Sp. 10 or more; 9 in *Fl. B. Ind.*

W. zeylanica, *Thw. Enum.* 191 (1860).
Chilocarpus zeylanicus, Wight, Ic. iv. pt. 2, 1. C. P. 1829.
Fl. B. Ind. iii. 624. Wight, Ic. t. 1288.

A large woody creeper, climbing by means of long whip-like leafless branches with distant, short, reflexed branchlets ending in 2 short hooks; l. $2\frac{1}{2}$–3 in., oval, acute at base, more or less acuminate, obtuse, entire, glabrous, rather thick, pink when young, lat. veins numerous, close, parallel, nearly horizontal, petiole $\frac{3}{8}$ in.; fl. shortly stalked, cymes $\frac{3}{4}$–$1\frac{1}{2}$ in., glabrous; cal.-segm. slightly ciliate; cor.-tube pilose within, mouth naked, lobes linear, acute, slightly spreading; ov. globose, glabrous; fruit 4–5 in., nearly globose, smooth, pink,

pericarp thick, entirely filled with pulp, in which are immersed numerous seeds each surrounded by a pulpy envelope; seed ¾–1 in. ovoid, compressed, testa thin, embryo large, dark crimson.

Forests of the moist region up to 4000 ft.; rather common. Fl. March; yellow.

Endemic.

First collected by Wight in 1835. This is one of several plants called 'Kiri-wel.' The handsome fruit, like a very large pink-cheeked apple, is a favourite food of monkeys. The stem is full of caoutchouc, but, as this does not remain elastic after consolidation by exposure to the air, it is of no use as rubber; but in its sticky condition it is employed by the Sinhalese, smeared on frayed-out bamboos, to catch the insects so destructive to crops of hill-paddy.

Allamanda cathartica, L., a native of Brazil, is very commonly met with in an apparently wild state in the low country. It, however, never produces seeds here. It is called 'Wal-Ruk-attana' by the Sinhalese. Moon has it in his Cat. (p. 19), and its introduction was probably not much before his time.

2. **CARISSA,** *L.*

Shrubs or small trees with paired spines at the nodes, dichotomously branched; l. small; fl. in axillary and terminal cymes; cal. small, segm. 5, narrow; cor.-tube cylindrical, narrow, lobes 5, overlapping to right; stam. 5, distinct, inserted in cor.-tube, included; ov. 2-celled, stigma conical; fruit ovoid, fleshy, indehiscent; seeds 2 or 4 with fleshy endosperm.—Sp. 20; 5 in *Fl. B. Ind.*

The rigid spines are clearly abortive inflorescences, and occasionally bear flowers at the forked extremities; they are found only at alternate nodes, and at these only does the dichotomous branching occur.

L. oblong, obtuse; fruit over ¾ in. . . . 1. C. CARANDAS.
L. broadly oval apiculate; fruit under ½ in. . . 2. C. SPINARUM.

1. **C. Carandas,** *L. Mant.* i. 52 (1767). **Maha-karamba,** *S.* **Perunkila,** *T.*

Moon Cat. 19. Thw. Enum. 191. C. P. 1823.
Fl. B. Ind. iii. 630. Wight, Ic. t. 426.

A small tree or large shrub, branches very numerous, divaricate, rigid, spines horizontal very sharp; l. oblong-oval or oblong-lanceolate, 1–2½ in., subacute at base, obtuse at apex, glabrous, thin; fl. in threes, shortly stalked, in clusters at end of short axillary and terminal peduncles, bracts small, linear; cal. and cor. as in the next; fruit ¾–1 in., ovoid, bluntly pointed, smooth, reddish-purple.

Dry region; rare. Jaffna (Gardner); Kurunegala (Thwaites). Fl. March; white.

Also in India and Malaya in the dry parts.

I suspect that this is only a cultivated plant in Ceylon. I have seen it only in the Botanic Garden, and it looks like a cultivated race of *C. spinarum*, with a larger fruit.

2. **C. spinarum,** *L. Mant.* ii. *app.* (1771). **Hin-karamba,** *S.* **Chirukila, Kilatti,** *T.*

Herm. Mus. 33. Fl. Zeyl. n. 405 (*Jasmino-nerium*). Moon Cat. 19. *C. diffusa*, Roxb., Thw. Enum. 191. C. P. 1822.

Fl. B. Ind. iii. 630. Wight, Ic. t. 427 (*C. diffusa*).

A small bush intricately and dichotomously branched with rigid, often zigzag, divaricate, cylindrical branches, spines $\frac{1}{4}$–$1\frac{1}{4}$ in. horizontal, very sharp, often bifurcate, bark white, young parts minutely pubescent; l. small, $\frac{3}{4}$–$1\frac{1}{4}$ in., broadly oval, acute at base, sharply apiculate, glabrous, rigid, shining above; fl. sessile, in two clusters of 3 at end of short stiff axillary and apparently terminal peduncles; cal. very small, puberulous, segm. linear, very acute, ciliate; cor.-tube $\frac{1}{2}$ in. or rather more, lobes a little shorter than tube, lanceolate, very acute, spreading; fruit $\frac{3}{8}$ in., broadly ovoid, shining, black, seeds 4.

Low country; common, especially in the dry region. Fl. all the year; white, sometimes stained with pink.

Also in India and Burma.

3. RAUVOLFIA,* *L.*

Perennial herbs or low shrubs, l. in whorls of 3, fl. in stalked, terminal cymes; cal. small, segm. 5; cor.-tube narrow, cylindrical, lobes broad, spreading, overlapping to left; stam. 5, inserted above middle of cor.-tube, anth. small, pointed; disk prominent, annular; carp. 2, distinct or slightly connate, each with 2 collateral ovules, stigma large, truncate, excavated beneath, bifid at point; ripe carp. distinct or slightly connate below, pulpy, seed solitary, with fleshy endosperm.—Sp. 40; 7 in *Fl. B. Ind.*

Rauvolfia and *Ophioxylon* are, doubtless, one genus. The species are mostly American.

Cor.-tube over $\frac{1}{2}$ in.; ripe carp. connate below . . 1. R. SERPENTINA.
Cor.-tube $\frac{1}{4}$ in.; ripe carp. distinct . . . . . 2. R. DENSIFLORA.

---

* L. Rauwolf travelled in the East in the sixteenth century, and collected many plants.

1. **R. serpentina,** *Hk. f. Fl. B. Ind.* iii. 632 (1882). **Éka-weriya, Rat-ékaweriya,** *S.*

Herm. Mus. 4. Burm. Thes. 141. Fl. Zeyl. n. 398. *Ophioxylon* serpentinum*, L. Sp. Pl. 1043. *O. trifoliatum*, Gaertn. Fruct. ii. 129. Moon Cat. 19. Thw. Enum. 191. C. P. 1836.

Fl. B. Ind. iii. 632. Burm. Thes. t. 64 (not good). Wight, Ic. t. 849.

An herbaceous perennial, rootstock vertical, long, nodular, yellowish, stem 1–2 ft., semi-woody at base, usually simple; l. spreading or drooping, 4 or 5 in., lanceolate, tapering at both ends, undulate, glabrous, thin, bright light green, petiole short, obscure; fl. on short stout ped., in rather close irregular corymbose cymes (rarely axillary) on long erect peduncles, bracts small, filiform; cal. glabrous, segm. small, linear, acute; cor.-tube $\frac{1}{2}$–$\frac{3}{4}$ in., dilated at insertion of stam., above this often bent, lobes short, rounded; ripe carp. over $\frac{1}{4}$ in., slightly connate, broadly ovoid, apiculate, shining, blackish-purple.

Shady places in grass in moist region to 2000 ft.; common. Fl. April, May; white tinged with violet, cal. bright red.

Also in India, Burma, and Java.

Garcia† (l. c.) calls the plant 'Rannetal,' and gives an account of the use of the root by the Mungoose—which he calls 'Quil' and 'Quirpele'—in its combats with the Cobra. The tale has no foundation in fact, nor does the root appear to be now employed here as a remedy for snake-bites, though it has a reputation against hydrophobia in native medicine. It is very bitter.

2. **R. densiflora,** *Hk. f. Fl. B. Ind.* iii. 633 (1882).

Ophioxylon ceylanicum, Wight, Ic. iv. pt. 2, 1. *O. densiflorum*, Thw. Enum. 191. C. P. 1834.

Fl. B. Ind. iii. 633. Wight, Ic. t. 1291 and 1292 (*O. neilgherrense*). Bot. Reg. t. 1273 (*Tabernæmontana densiflora*).

A small shrub, 2–4 ft., slightly branched, branches glabrous, with large lenticels; l. 3–5 in., lanceolate, tapering to base, acuminate, acute, glabrous, thin, pale beneath, petiole obscure; fl. on rather long slender ped., in lax few-flowered corymbose cymes, peduncles several together, terminal, compressed, 1–1$\frac{1}{2}$ in., lengthening with fruit; cal.-segm. linear, cor.-tube about $\frac{1}{4}$ in., cylindrical, hairy within, lobes much more than half as long as tube, oval, obtuse; ripe carp. $\frac{3}{8}$–$\frac{1}{2}$ in., quite distinct, ovoid, slightly pointed, bluish-grey.

Montane zone up to 6000 ft.; common. Fl. Jan.–May; white.

Also in the mountains of India.

---

* *Ophioxylon*, snake-wood. Probably the source of one sort of the *Lignum colubrinum* of Ceylon, a celebrated antidote to the poison of the Cobra, of which an account will be found in Garcia de Orta's Aromat. Hist. lib. i. cap. 44 (in Clusius' Exotic., 214). See also under *Ophiorrhiza Mungos* and *Strychnos colubrina.*

† Garcia de Orta lived at Goa 1534–62, and it is possible he may have visited Ceylon.

4. **ALYXIA,** *Br.*

A small shrub, l. often 3 in a whorl; fl. 1–3 together, terminal; cal. small, segm. 5, triangular, acute; cor.-tube slender, cylindrical, lobes 5, narrow, overlapping to left; stam. 5, distinct, inserted in upper part of cor.-tube, anth. pointed, slightly exserted; disk 0; carp. distinct, with 2–6 ovules in 2 rows in each, style long, stigma oblong-ovoid, bifid at top; ripe carp. distinct, shortly stalked, usually moniliform with 2–4 joints; seed solitary in each joint, with horny endosperm. —Sp. 30; 9 in *Fl. B. Ind.*, but none from the Peninsula.

A. zeylanica, *Wight*, *Ic.* iv. pt. 2, 2 (1850). **Wal-kaduru,** *S.*
Thw. Enum. 191. C. P. 1835.
Fl. B. Ind. iii. 636. Wight, Ic. t. 1293. Bedd. Fl. Sylv. Anal. t. 20, f. 5.

A small dichotomously branched bush, branches slender, obscurely quadrangular, glabrous; l. usually 3 in a whorl at the branching, rest opp., 2½–3 in., lanceolate or oval, often slightly falcate, acute at base, caudate-acuminate, obtuse, glabrous, thin, petiole short, obscure; fl. few, on rather long ped., terminal in the bifurcations; cal. glabrous; cor.-tube dilated at top, lobes linear, acute, recurved; joints of fruit about ½ in., oblong-ovoid, compressed, slightly pulpy, bright scarlet.

Moist low country to 2000 ft.; rather rare. Ambagamuwa; Hiniduma Pattu; Pantura; Heneratgoda. Fl. Feb.–March; pale yellow.

Endemic.

This must be referred to *Alyxia* with some doubt; the endosperm is not ruminate. Considered to be poisonous.

5. **HUNTERIA,*** *Roxb.*

Tree, l. opp., fl. rather small, cymes axillary; cal. small, segm. 5, acute; cor.-tube short, much inflated in upper part, lobes 5, rounded, much overlapping to left; stam. 5, distinct, inserted in upper part of cor.-tube, anth. oblong-lanceolate; disk 0; carp. 2, distinct, with 2 collateral ovules in each, style rather long, stigma small, bifid; ripe carp. stalked, fusiform-oval, beaked, fleshy, each usually 2-seeded; seed large, ovoid, embryo straight in axis of fleshy endosperm.—Sp. 2 or 3; 1 in *Fl. B. Ind.*

---

* Named after Dr. William Hunter, of the Bengal Medical Establishment, an eminent botanist. Died 1812.

H. corymbosa, *Roxb.! Fl. Ind.* (*ed. Carey and Wall.*) ii. 531 (1824). **Médiya,** *S.*

Herm. Mus. 5. Fl. Zeyl. n. 404 (*Apocyno-nerium*). *Cameraria zeylanica*, Retz. Obs. iv. 24. *C. oppositifolia*, Moon Cat. 20. *Alyxia* (?) *Moonii*, Wall. in Voight, Hort. Sub. Calc. 532. *H. zeylanica*, Gardn., and *H. Roxburghiana*, Wight, Thw. Enum. 191, 192. C. P. 1827, 2518.

Fl. B. Ind. iii. 637. Wight, Ic. tt. 428 and 1294 (*H. Roxburghiana*). Bedd. Fl. Sylv. t. 265 (*H. zeylanica*).

A small tree, young parts glabrous; l. 3–5 in., from oblong-oval to narrowly oblong-lanceolate, acute at base, more or less acuminate, obtuse, glabrous, shining above, lat. veins numerous, parallel, petiole $\frac{1}{4}$–$\frac{3}{4}$ in.; fl. pedicellate, in di- or trichotomous, stalked axillary (or terminal) cymes; cor.-lobes oval or almost circular, often somewhat oblique, slightly recurved; ripe carp. with an obtuse beak, smooth, yellow; seed over $\frac{3}{4}$ in., ovoid.

Moist low country; rather common. Colombo; Kalutara; Galle; Badulla; Maturata Dist. Fl. July–Sept.; yellow.

Also in S. India, Burma, and Penang.

The shape of the leaves varies. C. P. 2518 (*H. Roxburghiana*) is a narrow-leaved form, and C. P. 1827 (*H. zeylanica*) a very broad-leaved variety. Though included in his Fl. Zeyl., Linnæus never named this plant in his general systematic works. The leaves are used externally for wounds and cuts. Wood hard, yellow, fine-grained, smooth.

6. CERBERA, *L.*

Bush or small tree; l. alt., fl. large, in terminal panicles; cal.-tube 0 or very short, segm. 5, long, recurved; cor. funnel-shaped, lobes 5, longer than tube, overlapping to left; stam. 5, inserted about middle of cor.-tube, anth. apiculate, connate by their points above the stigma but free from it; disk 0; carp. 2, 2-lobed, each with 2 ovules, style very slender, stigma large, ovoid, with 2 truncate points; ripe carp. usually solitary, large, nearly globose, with a very thick woody-fibrous pericarp; seeds 1 or 2, ovoid, somewhat compressed, without endosperm.—Sp. 4; 1 in *Fl. B. Ind.*

C. Odollam,* *Gaertn. Fruct.* ii. 193 (1791). **Gon-kaduru,** *S.*

Herm. Mus. 49. Burm. Thes. 151 (part). Fl. Zeyl. n. 106 (part). *C. Manghas*, L. Sp. Pl. 208 (part). Moon Cat. 19. A. DC. in DC. Prod. viii. 353. Thw. Enum. 192. C. P. 1832.

Fl. B. Ind. iii. 638. Burm. Thes. t. 70, f. 1 (fruit only). Wight, Ic. t. 441.

A small tree or large shrub, branchlets whorled, very stout, marked with leaf-scars, twigs thick, glabrous and shining, l. large, alternate, rather closely placed at end of year's growth,

* The name given in Rheede, Hort. Malab.

5–10 in., linear-lanceolate or slightly obovate, much tapering to base, rather suddenly acuminate, subacute, glabrous, paler beneath, rather thick, venation pellucid, lat. veins numerous, horizontal, connected by an intramarginal one; fl. large, on stout ped., panicles flat-topped, peduncles erect, very stout, bracts large, oblong, acute, deciduous; cal.-segm. $\frac{3}{4}$–$\frac{7}{8}$ in., linear-oblong, acute, recurved, glabrous; cor.-tube $\frac{3}{4}$ in., lower third narrow, upper part dilated, throat nearly closed by 5 pubescent projecting wings, lobes 1 in., oval, obtuse, oblique; fil. very short; ripe carp. nearly globose, 3–3½ in., smooth, green.

By water in the low country below 1000 ft., chiefly near the sea; very common. Fl. all the year; white, throat yellow, sweet-scented.

Tropical shores of Asia, Australia, and Pacific Is.

Hermann confused this with *Tabernæmontana dichotoma*, which represents it in his Herbarium, whilst his drawings (70 and 71) are truly *Cerbera*. The confusion was followed by Burman and Linnæus. The large fruits, fibrous from the rotting of the soft portion of the outer coat, are very familiar objects floating on the water of the lagoons and back-waters of the coast-regions. The whole plant is full of an acrid milky juice; the seeds are an irritant poison.

7. **OCHROSIA,** *Juss.*

Small tree, l. whorled or alt., fl. small in terminal or lateral panicles; cal. very small, no tube, sep. 5, oval, short, obtuse, imbricate; cor.-tube short, cylindrical, naked within, lobes longer than tube, narrow, overlapping to right; stam. 5, minute, near summit of tube, anth. ovate, acute; disk 0; carp. distinct, ovules several, style slender, stigma small, truncate; ripe carp. usually both developed, pericarp very thick, spongy-woody; seed solitary, very much flattened, embryo with large flat foliaceous cotyledons in scanty horny endosperm.—Sp. 12; 1 in *Fl. B. Ind.*

O. borbonica, *Gmel. Syst. Veg.* i. 439 (1796). **Mudu-kaduru,** *S.* [PLATE LX.]

Cerbera parviflora, Forst., Moon Cat. 19. Thw. Enum. 192. C. P. 1833.

Fl. B. Ind. iii. 638.

A small tree, branchlets very stout, marked with whorls of large leaf-scars, twigs glabrous, glaucous green; l. irregularly placed, usually in whorls of 3 or 4, often crowded at ends of year's growth, rather large, 4–9 in., obovate-lanceolate, tapering to base, rounded or faintly acuminate and obtuse at apex, glabrous, shining, thick, paler beneath, venation pellucid, lat.

veins rather numerous, nearly horizontal, petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; fl. small, on very short stout ped., mostly in pairs, very closely placed on short thick branches of rather small dichotomous panicles with long peduncles coming off 2 or 3 together from the nodes and at first appearing terminal, bracts very small, fleshy; cal.-segm. ovate, very fleshy, glabrous; cor.-tube under $\frac{1}{4}$ in., lobes about $\frac{1}{4}$ in., oblong, obtuse; ripe carp. $2\frac{1}{2}$ in., recurved, obliquely ovoid, bluntly pointed, glabrous, bright yellow; seed solitary, large, very flat.

Seacoast in the moist region; common, *e.g.*, Colombo, Kalutara, &c. Fl. Feb., March, July; greenish-white.

Also in Singapore, Java, Andaman Is., Mascarene Is., &c., but not in Peninsular India.

A more decidedly maritime species than *C. Odollam*, easily known by its small flowers. Full of thick, milky juice, which is extremely viscid.

8. **VINCA,** *L.*

Annual herb, l. opp., fl. small, solitary, axillary; cal.-tube short, segm. 5, much longer; cor.-tube cylindrical, throat constricted, lobes broad, overlapping to left; stam. 5, inserted on cor.-tube; disk of 2 glands; carp. 2, distinct, with several ovules in 2 series in each; ripe carp. follicular, linear, dehiscent, with about 8 seeds, seed cylindrical, truncate at both ends, ribbed, with fleshy endosperm.—Sp. 10; 1 in *Fl. B. Ind.*

V. pusilla, *Murr. Act. Goett.* 66 (1773).
Fl. B. Ind. iii. 640 (not given for Ceylon). Rheede, Hort. Malab. ix. t. 33.

A small annual, 3–6 in., with spreading quadrangular glabrous branches from the base; l. 1–2 in., on short petioles, ovate-lanceolate, tapering, acute, glabrous, margin scabrous; fl. on very short ped., very small; cal. glabrous, segm. very narrow, spreading; cor. about $\frac{1}{3}$ in.; follicles spreading, 1–$1\frac{1}{2}$ in., linear, straight, pointed, striate; seed linear-oblong, with vertical muriculate ridges, black.

Dry region; very rare. Found for the first time in 1889 between Jaffna and Kankesanturai. Fl. Dec., Jan.; white.

Common throughout India.

V. rosea, L., the Madagascar Periwinkle, is a very common weed on waste ground throughout the island. Its native country is uncertain, as it is now found throughout the Tropics; the earliest record I have for it in Ceylon is 1804. The flowers are rose-coloured or white.

Plumeria acutifolia, Poir. (*P. acuminata*, Ait.), Wight, Ic. t. 471, is a familiar tree in the low country, especially about Buddhist shrines, whence it is known as the 'Temple-tree' by the English; the Sinhalese call it

Alariya. It is always a planted tree, and very rarely produces seed here.* Nor can the time of its introduction be very far back; indeed, I have not met with earlier printed mention of it here than in Moon Cat. 20 (1824). Further east it was known in the latter part of the seventeenth century, and Rumphius, who first described and figured it under the name of 'Flos convolutus,' says (Herb. Amb. iv. 85, t. 38) that it was brought to Ternate and Amboyna by Chinese merchants from Cambodia. It was introduced as a stove plant to England from the 'East Indies' in 1790. Thus all its history is that of a plant of the Eastern Tropics, yet nowhere in that region has it been noticed as a wild plant. Moreover, as all the other species of *Plumeria* (over 40) are known only as natives of Tropical America, it is reasonable to suppose that this one also was brought originally from the New World; but I do not find that it has been recorded as a wild plant even there.

9. HOLARRHENA, *Br.*

Tree, l. opp., fl. rather large, in axillary cymes; cal.-tube very short, segm. 5, linear, acute; cor.-tube very slender, naked in the throat, lobes 5, strap-shaped, longer than tube, overlapping to left; stam. 5, inserted at base of tube, anth. very acute; disk 0; carp. 2, distinct, ovules numerous; ripe carp. both developed, follicular, very long and slender, obtuse, many-seeded; seed linear, compressed, with a long tuft of hair (coma) at one end, endosperm scanty.—Sp. 8; 2 in *Fl. B. Ind.*

H. mitis, *Br. in Mem. Wern. Soc.* i. 62 (1811). **Kiri-walla, Kiri-mawara,** *S.*

Carissa mitis, Vahl, Symb. Bot. iii. 44. *Echites lanceolata*, Moon Cat. 20. Thw. Enum. 194. C. P. 756.

Fl. B. Ind. iii. 645. Vahl, l. c. t. 59.

A rather tall slender tree, with whitish rather smooth bark, branchlets slender, drooping, with smooth purplish bark, young parts glabrous; l. $1\frac{1}{2}$–$3\frac{1}{2}$ in., on short petioles, oblong-lanceolate, acute at base, acuminate, obtuse, glabrous, thin, usually recurved, veins pellucid, lat. ones much curved; fl. on rather long slender pubescent ped., in short lax corymbose or paniculate cymes, bracts very small, acicular; cal.-segm. very acute; cor.-tube about $\frac{3}{8}$ in., lobes $\frac{5}{8}$ in., strap-shaped, obtuse; follicles 1–$1\frac{1}{2}$ ft. long, linear, cylindrical, smooth; seed narrow, coma copious, twice as long as seed, reddish.

Low country to 1500 ft., chiefly in the dry region; rather rare. Ratnapura; Negombo; Sigiri; Gunner's Quoin (Nevill) a single plant. Fl. April; pure white, sweet-scented.

Endemic.

---

* Ripe fruit has been twice sent to me from the Knuckles District, but I have never met with it elsewhere.

Vahl's specimens were from Kœnig. Wood very fine-grained, rather soft and light, pale yellowish-white shining; both it and the bark are much used as a remedy in fevers and dysentery. The bark is sold under the name of 'Kalinda,' and is valued as an antiperiodic.

10. **TABERNÆMONTANA**,* *L.*

Small tree, l. opp., fl. large, in few-flowered axillary (apparently terminal) cymes; cal.-tube very short, segm. short, obtuse; cor. large, tube cylindrical, widening upwards, naked within, lobes 5 or 6, longer than tube, strongly overlapping to left; stam. 5, inserted below middle of cor.-tube, anth. nearly sessile, distinct; disk 0; carp. 2, distinct, ovules numerous, style short, stigma bifid; ripe carp. distinct, fleshy but dehiscent along ventral suture; seeds very numerous, each surrounded by a pulpy envelope, oblong-ovoid, not compressed, grooved down one side, without a coma, endosperm plane.—Sp. 110; 14 in *Fl. B. Ind.*

T. dichotoma, *Roxb. Hort. Beng.* 20 (1814). **Divi-kaduru,** *S.*
Herm. Mus. 32. Burm. Thes. 151 (part). Fl. Zeyl. n. 106 (chiefly). *Cerbera Manghas*, L. Sp. Pl. 208 (chiefly). Moon Cat. 20. Thw. Enum. 192. C. P. 2834.
Fl. B. Ind. iii. 645. Burm. Thes. t. 70, f. 1 (excl. fruit). Wight, Ic. t. 433. Bot. Reg. 1841, t. 53.

A small dichotomously branched tree, bark pale grey, smooth, branchlets marked with scars of fallen l., young parts glabrous, covered with a shining resinous coat; l. numerous, 4–7 in., lanceolate-oblong, tapering to base, suddenly and shortly acuminate, obtuse, stiff and coriaceous, dark green above, paler beneath, lat. veins numerous, horizontal, parallel, depressed above, prominent beneath, petiole $\frac{1}{2}$–$1\frac{1}{4}$ in., stout; fl. few, on long stout ped., cymes in axils of terminal pair of l., lax, peduncle 2–6 in., stout, glabrous, bracts small, ovate, fleshy, adpressed; cal. fleshy at base, segm. rounded, glabrous; cor. $1\frac{1}{2}$–3 in. diam., tube $\frac{3}{4}$–1 in., fleshy, lobes considerably longer, oblong, obtuse, falcately twisted, often crisped at margin; anth. acute; ov. glabrous, style clavate; ripe carp. about 2 in., pendulous, horizontally divaricate or reflexed, broadly ovoid, blunt, flat on dorsal, rounded on ventral side, smooth, orange-yellow; seed $\frac{3}{4}$ in., finely striate, surrounded by a coat of crimson pulp.

---

* Named in commemoration of Jacobus Theodorus, author of the 'Neuw Kreuterbuch,' 1588, and called Tabernæmontanus from the place of his birth, Bergzabern, Elsass. He died in 1590.

Moist low country to 2000 ft.; common. Fl. April, May; white, throat and tube yellow, very sweet-scented. Also in Malabar (?).

This is called 'Eve's Apple,' or the 'Forbidden Fruit' by the English in Ceylon. The flowers vary a good deal in size; before expansion the buds are covered with a skin of dry resinous exudation. The wood, the bark, and the seeds are all used as external applications. Wood pale, fine-grained, moderately hard. Milk not acrid.

T. coronaria, Br., is extremely common in gardens (especially with double flowers), and is only known as a cultivated plant. There are specimens in Hermann's Herb.; it is *Nerium divaricatum*, L. (Fl. Zeyl. n. 109), and Burman figures it in Thes. t. 59. It is, no doubt, one of our oldest garden plants, and is of unknown origin.

11. **ALSTONIA,*** *Br.* (non L. f.).

Large tree, l. in whorls of 7; fl. rather small, in terminal paniculate cymes; cal.-tube very short, segm. 5, very obtuse, imbricate; cor.-tube cylindrical, rather wide, hairy within the throat, lobes 5, much shorter than tube, rounded, overlapping to left; disk 0; stam. 5, inserted in upper part of cor.-tube, anth. distinct, pointed; carp. 2, distinct, stigma ovoid; ripe carp. distinct, follicular, very long and slender, acute; seeds numerous, oblong, flat, with a fringe of hair at both ends, endosperm scanty.—Sp. 30; 8 in *Fl. B. Ind.*

A. scholaris,† *Br. in Mem. Wern. Soc.* i. 75 (1811). **Ruk-attana,** *S.* **Elilaippalai,** *T.*

Echites scholaris, L., Moon Cat. 20. Thw. Enum. 193. C. P. 1840.
Fl. B. Ind. iii. 642. Wight, Ic. t. 422 (not good). Bedd. Fl. Sylv. t. 242. Bentl. & Trim. Med. Pl. t. 173.

A tall tree, trunk erect, branches whorled, bark grey, rough but not furrowed, branchlets copiously lenticellate, glabrous; l. usually 7 in a whorl, at end of year's growth, $3\frac{1}{2}$–$6\frac{1}{2}$ in., oblong or obovate-lanceolate, acute at base, obtuse rounded or emarginate at apex, very faintly crenate, glabrous, bright green and shining above, paler with a white 'bloom' beneath, rather thick, lat. veins numerous, slender, not prominent, petiole very short, with a blunt hooked fleshy process on the upper surface at the base; fl. nearly sessile, in small cymose clusters terminating whorled or umbellate branches of erect pubescent panicles 3–4 in. long, bracts ovate, pubescent; cor. pubescent, lobes truncate; carp. hairy; follicles

---

* Charles Alston was Professor of Botany in Edinburgh University from 1719 till his death in 1760.

† The *Lignum scholare* of Rumphius, the light wood being used to make 'slates' for school children.

12–18 in., very slender, cylindrical, pendulous, becoming completely everted after dehiscence.

Low country up to 3000 ft.; common. Fl. April; greenish-white.
In the Eastern Tropics generally.
The follicles hang in pendulous clusters, and the whole inflor. falls together. The wood is very light and soft, pale yellowish-white; its principal use is for coffins. The bark is a valuable astringent tonic, much used in fevers; it is an official drug in the Indian Pharmacopœia.

12. **PARSONSIA,** *Br.*

Perennial twiner, l. opp., fl. rather small, in axillary corymbose cymes; cal.-tube short, segm. short; cor.-tube short, inflated, naked in throat, lobes longer than tube, oblong, overlapping to right; disk of 5 triangular lobes; stam. 5, inserted at base of cor.-tube, fil. spirally twisted together, anth. exserted, connate to form a tube adnate to stigma, cells prolonged into spurs at the base; carp. connate, ov. 2-celled with very numerous ovules in each cell, style long, stigma ovoid, bifid, fruit dry, linear, at last septicidally 2-valved, the valves also separating from septum; seeds very numerous, narrowly linear, with a coma of silky hair more than twice its length; endosperm scanty.—Sp. 12; 1 in *Fl. B. Ind.*

P. spiralis, *Wall. Cat. n.* 1631 (1828).
Heligme spiralis, Thw. Enum. 193. C. P. 1862.
Fl. B. Ind. iii. 650. Wight, Ic. t. 1303 (*H. Rheedii*).

Stems stout, long, twining, glabrous, l. rather large, 3–7 in., oval or lanceolate-oval, usually rounded at base, acuminate, acute, glabrous, thin, petiole ½ in., fl. pedicellate, cymes paniculate-corymbose, peduncles 1½–3 in., glabrous, bracts very small; cal.-lobes narrowly triangular, acute; cor.-lobes fleshy, obtuse; cone of anth. oblong, bluntly pointed; fruit about 6 in., linear, sharply pointed, cylindrical, glabrous, the constituent carp. at length separating except at points; seed about ½ in., beaked.

Low country; very common. Fl. August; purplish-green.
Also in India, Malaya, and China.
Very like an *Asclepiadea* in habit.

13. **VALLARIS,** *Burm.*

Twining shrub, l. opp., fl. rather large, in axillary paniculate cymes; cal. deeply cut into 5 lanceolate segm.; cor.-tube very short, cylindrical, lobes 5, shallow, rounded, spreading,

overlapping to right; stam. 5, inserted at mouth of cor., fil. short, villous within, with a large rounded knob on the back, anth. connivent into a cone, adnate to stigma, cells with a long curved spur at the base; disk a 5-lobed ring; carp. connate, ov. 2-celled, with numerous ovules in each cell, stigma oblong-ovoid; fruit narrowly oblong, tardily splitting from below into component carp.; seeds very numerous, compressed, slightly beaked, with a long coma, endosperm scanty. —Sp. 6; 4 in *Fl. B. Ind.*

V. Heynei, *Spreng. Syst.* i. 635 (1825).
V. dichotoma, Wall., Thw. Enum. 192. C. P. 2519.
Fl. B. Ind. iii. 650. Wight, Ic. t. 438 (*V. dichotoma*).

A large woody twiner with a stout stem and many opp. branches, bark thick, yellowish-white, smooth, young parts pubescent; l. $3\frac{1}{2}$–$4\frac{1}{2}$ in., oblong-lanceolate, acute at base, acuminate, acute, very glabrous and shining on both sides, rather thick, veins pellucid, reticulate, petiole $\frac{1}{2}$ in.; fl. on rather long, slightly drooping, pubescent ped., cymes short, bracts small, lanceolate, acute; cal.-segm. acute, pubescent; cor. about $\frac{3}{4}$ in. diam., finely pubescent outside, nearly globose in bud, tube about as long as cal.-segm., hairy within, lobes concave; fil. very stout, anth. sharply pointed; ov. and style hairy, stigma pointed; fruit 4–6 in., smooth, fibrous but rather fleshy; seed $\frac{1}{2}$ in., coma twice as long.

Low country; rare. Hanguranketa; Matale. Fl. Feb.–July; pale greenish-white, sweet-scented.
Also in India.
The flowers have the scent of almonds.

V. Pergulana, Burm., C. P. 2515, is given in Thw. Enum. 192 as from Colombo, Ferguson. It is only cultivated there, and is a Malayan species. Figured in Wight, Ic. t. 429.

14. **WRIGHTIA,*** *Br.*

Small trees or shrubs, l. opp., fl. rather large in corymbose terminal cymes; cal. with scales within, segm. 5, obtuse; cor.-tube short or long, lobes long, obtuse, overlapping to left, with a corona of distinct erect scales at mouth in 1–4 series of five or ten (or connate into a ring); stam. 5, anth. connivent into a cone, adnate to stigma, sagittate at base, much exserted; carp. connate or distinct, stigma ovoid; ripe carp. distinct

* Commemorates Dr. William Wright, F.R.S., who spent eighteen years in Jamaica. Died 1819.

(or connate, but at length separating), linear; seeds linear, compressed, with a long coma at base, endosperm scanty or 0.—Sp. 12; 6 in *Fl. B. Ind.*

Cor.-tube very short.
  Cor.-scales distinct.
    Cor.-scales 20; l. slightly hispid on veins . 1. W. FLAVIDO-ROSEA.
    Cor.-scales 5; l. glabrous . . . 2. W. ANGUSTIFOLIA.
  Cor.-scales connate; l. tomentose . . 3. W. TOMENTOSA.
Cor.-tube long; cor.-scales 30 . . . 4. W. ZEYLANICA.

1. **W. flavido-rosea,** *Trim. in Journ. Bot.* xxiii. 238 (1885). [PLATE LXI.]

W. Rothii (?), var. *puberula*, Thw. Enum. 193. Trim. in Journ. Bot. xxvii. 164. C. P. 1837.

A small tree, branchlets thickened at nodes, young parts puberulous; l. 4–6 in., narrowly lanceolate, tapering at both ends, slightly acuminate, obtuse, rough, with short hair on the veins on both sides especially beneath, deep green, paler beneath, venation prominent beneath, petiole very short, pubescent; fl. large, ped. long, thickened upwards, pubescent, 3–12 in cyme, buds bluntly pointed, bracts very small; cal. pubescent, segm. broadly oval-triangular, obtuse, thick and swollen at base, membranous at edges, scales small, ovate; cor. $1\frac{1}{2}$ in. diam., tube about $\frac{1}{8}$ in., lobes oval-oblong, obtuse or subacute, puberulous on both sides, not fleshy, coronal scales 20, 10 strap-shaped and cut about half way down into 3 filamentous segm. (5 opp. and adnate to base of cor.-lobes, and 5 opp. and just outside stam.), and 10 linear and undivided in pairs between the stam.; anth. pubescent outside, with a tuft of white hairs at summit; ov. hairy on top, style thickened upwards, stigma with two short papillæ on summit; ripe carp., at first connate into a cylindrical fruit, but soon separating, except at the points, 8–9 in., about $\frac{1}{2}$ in. wide, very sharply pointed, glabrous; seeds very numerous, $\frac{3}{4}$ in., linear, truncate, coma about 2 in.

Dry or intermediate region, rare. Dambulla (Gardner); foot of Doluwa Kande, Kurunegala Dist. Fl. May; pale yellow at first, afterwards orange-pink, finally purplish-grey, anth. dirty white.

Endemic.

Inner bark very fibrous and strong. *W. Rothii*, G. Don, of S. India, to which Thw. very doubtfully referred this, is figured in Wight, Ic. t. 1319, and is considered a variety of *W. tinctoria*, Br., in Fl. B. Ind.

[*W. tinctoria*, Br., a native of India, has not been found wild in Ceylon. C. P. 1838 is from the Botanic Garden.]

2. **W. angustifolia,** *Thw. Enum.* 193 (1860).

Thw. Enum. 193, 424. C. P. 1839.

Fl. B. Ind. iii. 653.

A small tree, with slender cylindrical branches, young parts glabrous; l. nearly sessile, 3–3½ in., lanceolate-linear, tapering to base, caudate-acuminate, obtuse, glabrous, thin, fl. rather small on long very slender ped., cymes stalked, rather lax, terminating lat. branchlets, buds oblong, blunt; cal.-segm. oval, obtuse, slightly ciliate; cor. about ½ in. diam., pubescent on both sides, lobes oblong-linear, obtuse, coronal scales 5, petaloid, alt. with lobes, and about ⅔ their length, bifid and laciniate; ripe carp. 7–10 in., quite distinct, linear, cylindrical, slender, glabrous, and shining; seeds linear, over ½ in., coma 1½ in., pale orange-coloured.

Dry country, rare. Dambulla (Gardner); Trincomalie (Glenie); Anuradhapura. Fl. June, July; creamy-white.

Endemic.

The wood requires examination.

3. **W. tomentosa,** *Roem. & Schultes, Syst.* iv. 414 (1819). **Palmadankai,** *T.*

Thw. Enum. 193. C. P. 2691.

Fl. B. Ind. iii. 653. Wight, Ic. t. 443, Ill. t. 154 (*W. mollissima*).

A small tree, with opp. divaricate branches, bark rather thin, smooth, yellowish-grey, branchlets pubescent, young parts finely tomentose; l. 3–6 in., lanceolate or oval, acute at base, slightly acuminate, obtuse, pilose above, tomentose-pubescent and pale beneath, venation finely reticulate, pellucid, prominent beneath; fl. large, on short, stout, tomentose ped., cymes shortly stalked, rather dense; cal. tomentose, lobes very short, rounded, incurved; cor. 1¼–1½ in. diam., tube short, lobes oblong-ovate, obtuse, thick, fleshy and brittle, coronal scales connate into a 5-lobed cup; anth. hairy outside; ripe carp. connate into a cylindrical fruit, 6–8 in. by 1 in. wide, blunt, with 2 vertical grooves, rough with worts, ultimately separating; seeds over ½ in., linear, coma 1½–2 in., white.

Low country, rather rare. Heneratgoda; Kaduganawa; Ambagamuwa; Batticaloa. Fl. Jan.–April; at first yellowish, afterwards purple.

Also in India, Burma, and Penang.

The flowers have an unpleasant scent. The corolla changes colour remarkably; when first open it is green outside and pale dull greenish-ochre within with the corona salmon-coloured, but the whole becomes gradually dull inky-purple. Wood yellowish-white, moderately heavy, smooth, even-grained.

4. **W. zeylanica,** *Br. in Mem. Wern. Soc.* i. 73 (1811). **Wal-idda, Sudu-idda,** *S.*

Burm. Thes. 167, 23. Fl. Zeyl. n. 107. *Nerium antidysentericum*, L. Sp. Pl. 209. *N. zeylanicum*, L. Syst. Nat. ed. 10. *W. antidysenterica*, Br. l. c.; Moon Cat. 19. Thw. Enum. 193. C. P. 1825.

Fl. B. Ind. iii. 654. Burm. Thes. t. 77, and t. 12, f. 2 Gaertn. Fruct. ii. t. 117 (fruit).

A slender shrub, 3–5 ft., with few erect branches, young parts glabrous; l. 2–4 in., oval or lanceolate, generally acute at base, shortly acuminate, glabrous, obtuse, rather thick, venation reticulate, petiole very short; fl. rather large, on longish ped., few, cymes shortly stalked, erect, glabrous; cal.-segm. oval-oblong, obtuse, slightly ciliate; cor. $1\frac{1}{2}$–$1\frac{3}{4}$ in. diam., tube long, $\frac{3}{4}$ in., slender, glabrous, lobes obovate-oval, obtuse, coronal scales 30 in 4 rows, outermost row of 5 longest, adnate to cor.-lobes and deeply 3-fid, second row of 5 shorter, alt. with cor.-lobes, 3-fid, third row of 10 (in pairs) short, erect, opp. pet., innermost row of 10 (in pairs) very short, erect, acicular opp. stam.; ripe carp. distinct, except at the points, 4–6 in., linear, cylindrical, glabrous, seed $\frac{3}{8}$ in., coma $\frac{3}{4}$ in., white.

Moist low country in open ground, especially near the sea, very common. Fl. all the year; brilliant white.

Endemic.

This is an extremely common little shrub about Colombo, and the flowers are much used in bouquets. The flowers vary in size, and hence Burman figured this twice; the smaller-flowered form (t. 12, f. 2) is that to which the name *N. zeylanicum*, L., belongs, Hermann's specimen being the larger-flowered form, the type of *N. antidysentericum*, L., figured in Burm. t. 77. Brown continued to maintain the two species, though expressing a doubt as to their distinctness. The bark and wood are used for external application.

15. **CHONEMORPHA,** *G. Don.*

A twining shrub, l. opp., fl. very large, in terminal racemose cymes; cal. campanulate, segm. 5, deep, oval, imbricate; cor.-tube cylindrical, inflated near base, lobes much longer, obovate-truncate, much overlapping to right; stam. 5, inserted in inflated base of cor.-tube, fil. short, anth. connivent in a cone, not exserted, adnate to stigma; disk of 5 small glands; carp. distinct, stigma oblong, pointed; ripe carp. distinct, linear, trigonous; seeds ovoid, compressed, coma long, endosperm very scanty.—Sp. 2; 1 in *Fl. B. Ind.*

C. macrophylla, *G. Don, Gen. Hist.* iv. 76 (1838). **Bu-wal-anguna,** *S.* (Moon).

Echites fragrans, Moon Cat. 20. Thw. Enum. 194. C. P. 661. Fl. B. Ind. iii. 661. Wight, Ic. t. 432.

A large woody twiner, branchlets stout, hairy; l. large, 5–12 in., broadly oval, cordate at base, very shortly and suddenly acuminate, shortly hairy above, densely silky-pubescent beneath, petiole $\frac{3}{4}$ in., densely pubescent; fl. very large, on stout pubescent ped. 3–10 in., cymes erect, bracts

ovate, acute, pubescent; cal. glabrous, tube broad-based, segm. acute, slightly ciliate; cor.-tube about 1 in., glabrous in throat, lobes $1\frac{1}{2}$–2 in., often undulated at margin; fil. hairy, anth. narrow, very acute; follicles about 12 in., linear, very pointed, smooth; seed $\frac{3}{4}$ in., beaked, coma 2 in., copious.

Moist low country to 2000 ft., rather rare. Kandy; Kaduganawa; Kalutara. Fl. April, May; white tinged with yellow.

Also in India and Malaya.

The great white flowers are very conspicuous.

16. **AGANOSMA,** *G. Don.*

Climbing shrub, l. opp., fl. moderate-sized, in rounded terminal cymes; cal. cut to base into 5 distinct sep., with 5 oblong scales within; cor.-tube narrow at base, inflated above, lobes 5, narrow, slightly overlapping to right; stam. 5, inserted near base of cor.-tube, anth. connivent over and adnate to stigma, very acute, included; disk of 5 lobes round the ov.; carp. distinct, stigma truncate; follicles distinct, divaricate, linear, at first tomentose; seeds oblong-oval, compressed, scarcely beaked, with a long coma, endosperm scanty.—Sp. 5; all in *Fl. B. Ind.*

A. cymosa, *G. Don, Gen. Hist.* iv. 77 (1838).
A. elegans, G. Don, Thw. Enum. 194. C. P. 1850.
Fl. B. Ind. iii. 665. Wight, Ic. t. 1304.

A large, woody, much-branched climber, twigs adpressed-pubescent; l. $2\frac{1}{2}$–$4\frac{1}{2}$ in., oval or lanceolate-oval, acute at base, very acute at apex, glabrous, venation reticulate, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. on short tomentose ped., cymes rather dense, buds pointed; sep. $\frac{3}{8}$ in., linear-lanceolate, very acute, tomentose on both sides; cor.-tube with lines of hair behind stam. within, lobes about as long as sep., lanceolate, very acute, tomentose outside; anth. rigid, sagittate at base; ov. hairy; follicles 6–9 in., linear, cylindrical, pointed, becoming nearly glabrous; seeds $\frac{5}{8}$ in., glabrous, black, coma $1\frac{1}{4}$ in.

Low country, rather rare. Pasdun Korale; Haragama. Fl. May, June; yellowish-white.

Also in Peninsular India and Sylhet.

This is var. 4, *elegans*, of the Fl. B. Ind., of a variable species.

17. **BAISSEA,** *A. DC.*

Diffuse glabrous shrub, l. opp., fl. very small, in paniculate apparently axillary cymes; cal. very small, deeply 5-cleft,

with 5 bifid scales within; cor.-tube cylindrical, lobes 5, short, overlapping to right; stam. 5, inserted at base of cor.-tube, anth. connivent and adherent to stigma; disk large, fleshy, surrounding carp.; follicles distinct, linear, coma long, endosperm scanty.—Sp. 7; 2 in *Fl. B. Ind.*, but neither from Peninsular India.

B. acuminata, *Hk. f. in Fl. B. Ind.* iii. 662 (1882).
Cleghornia acuminata*, Wight, Ic. iv. pt. 2, 5; Thw. Enum. 194. *C. cymosa*, Wight, l. c. C. P. 1861.
Fl. B. Ind. iii. 662. Wight, Ic. tt. 1310 and 1312 (*C. cymosa*).

A diffuse semi-scandent shrub, branches slender, cylindrical, young parts glabrous, pink; l. $3\frac{1}{2}$–5 in., lanceolate-oblong, acute at base, suddenly contracted into a narrow obtuse tail at apex, glabrous, thin, venation reticulate, lat. veins rather numerous, horizontal, looped within margin, petiole $\frac{1}{4}$ in., slender; fl. very small, numerous, on short, slender, glabrous ped., cymes peduncled, usually lax, at first terminal, but becoming apparently axillary by growth of lateral branch; cal.-segm. oblong, obtuse; cor.-tube hairy within, lobes much shorter than tube, ovate, acute; anth. hairy on back, apiculate; disk half concealing carp., follicles 10–12 in., slender, attenuate, glabrous; seeds large, $1\frac{1}{4}$–$1\frac{1}{2}$ in., oblong, tapering to both ends, coma 2 in.

Moist region, 2000–5000 ft., rather common. Fl. Feb.; orange-yellow. Endemic.

18. ANODENDRON, *A. DC.*

Woody twiners, l. opp., subcoriaceous, fl. very small, in copious axillary and terminal paniculate cymes; cal.-segm. 5, very small; cor.-tube short, cylindrical, lobes 5, very narrow, strongly overlapping to right; stam. 5, inserted near base of cor.-tube, anth. connivent, adherent to stigma; disk cupular, lobed; carp. distinct, ovules few, style very short, stigma thick, pointed; follicles stout, tapering, woody; seeds few, oval, compressed, strongly beaked, coma long.—Sp. 7; 4 in *Fl. B. Ind.*

Beak of seed $\frac{1}{4}$ in., stout . . . . . . 1. A. PANICULATUM.
Beak of seed $\frac{3}{4}$–1 in., very slender . . . 2. A. RHINOSPORUM.

---

* Dedicated to Hugh Cleghorn, M.D., of the Madras Medical Establishment; the first Conservator of Forests, Madras, 1857–63.

1. **A. paniculatum,** *A. DC. Prod.* viii. 444 (1844). **Dul, Aswel,** *S.*
Ichnocarpus paniculata, Moon Cat. 20. Thw. Enum. 194. C. P. 1843.
Fl. B. Ind. iii. 668. Wight, Ic. t. 396.

A very large woody twiner, stems reaching 3 or more in. diam., much dichotomously branched, bark greyish-brown, young parts glabrous; l. 4–6 in., oval-oblong, rounded at base, shortly and suddenly acuminate, obtuse, glabrous and shining on both sides, subcoriaceous, lat. veins numerous, prominent beneath, petiole $\frac{1}{2}$ in., stout; fl. very small, on slender glabrous ped., numerous, cymes large, lax, trichotomous, bracts small, deciduous; cal.-segm. ovate, acute, slightly ciliate; cor. $\frac{1}{2}$ in. diam., tube cylindrical, hairy in throat, lobes spreading, linear, obtuse, slightly falcate, with scattered white hairs on upper surface; stam. with very short broad fil.; stigmas sessile, pointed; follicles 4–6 in., divaricate, ovate-oblong, cylindrical, blunt, glabrous, hard and woody, black; seeds few, 8–12, all attached to basal placenta, oval, much compressed, broad, flat, about 1 in. of which $\frac{1}{4}$ is beak, reddish-brown, coma over 3 in., copious.

Moist low country up to 2000 ft., very common. Fl. March; pale dull orange.

Also in E. Bengal, Burma, W. India, Java, Philippines.

It is remarkable that this conspicuous plant seems to be unrecorded until Moon. The stems afford a very strong fibre.

2. **A. rhinosporum,** *Thw. Enum.* 194 (1860).
C. P. 2579.
Fl. B. Ind. iii. 669.

A twining shrub, branchlets slender, glabrous; l. 3–5 in., oblong-lanceolate, acute at base, shortly acuminate, obtuse, glabrous, subcoriaceous, lat. veins inconspicuous, petiole $\frac{1}{4}$ in., fl. on rather long, slender, glabrous ped., in large, long-stalked, very slender and lax, glabrous, divaricate cymes; cal.-segm. triangular, acute, cor.-lobes linear-filiform, acute, very falcate; anth. blunt, apiculate; disk cup-shaped, lobed; stigma nearly sessile; follicles 3–5 in., linear-oblong, tapering from base, bluntly pointed, glabrous; seeds few, $1\frac{1}{2}$–2 in., half of which is composed of a very long slender beak, coma over 2 in.

Moist region, rare. Maturata and Ambagamuwa Districts (Thwaites). Fl. Nov., March; dull orange.

Endemic.

19. ICHNOCARPUS, *Br.*

Woody twiner, l. opp., rather small, fl. small, in elongated paniculate, axillary and terminal cymes; cal.-segm. 5, very

small; cor.-tube narrow below, inflated above, villous at mouth, lobes 5, linear, much overlapping to right; stam. 5, inserted in wide part of cor.-tube, connivent over and adnate to stigma, disk 5-lobed; carp. distinct, style short, stigma truncate; follicles long, linear, slender; seeds linear, not compressed, coma long, copious endosperm.—Sp. 6; 3 in *Fl. B. Ind.*

1. frutescens, *Ait. Hort. Kew. ed.* 2, ii. 69 (1811). **Kiri-wel,** *S.* Herm. Mus. 71. Burm. Thes. 23. Fl. Zeyl. n. 114. *Apocynum frutescens*, L. Sp. Pl. 213. Moon Cat. 20. Thw. Enum. 194. C. P. 1863. Fl. B. Ind. iii. 669. Burm. Thes. t. 12, f. 1.

A large twining shrub, much branched, branchlets long, slender, whip-like, finely fulvous-tomentose; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., ovate-oval, rounded at base, acute, glabrous above, slightly hairy and paler beneath, petiole very short; fl. numerous, on short tomentose ped., in clusters of 3, arranged in narrow interrupted cymes; cal. hairy, segm. acute; cor.-lobes undulate, more or less hairy above, ciliate; ov. hairy; follicles 4–6 in., spreading, very slender, at first rusty-pubescent, afterwards glabrous; seeds 1 in., linear, black, coma $1\frac{1}{4}$ in.

Low country to 3000 ft., especially in the dry region, common. Fl. Dec.; yellow.

Also in India, Java, Burma, Australia.

LXXXV.—ASCLEPIADEÆ.

Herbs or undershrubs nearly always twining, l. opp. (absent in *Sarcostemma*), entire, without stip.; fl. regular, bisexual, usually in cymes from the nodes; cal. free, segm. 5, imbricate; cor. usually with a short tube (long in *Ceropegia*), sometimes with a ring of scales or processes in the throat (*corolline corona*); lobes 5, valvate or contorted; stam. 5, inserted on base of cor., fil. usually connate into a fleshy tube (*column*) rarely distinct, usually with fleshy scales or processes on the back (*staminal corona*), anth. connate or distinct, adnate by the broad connective to the stigma, usually prolonged into a membranous inflexed tip, 2-celled, pollen combined into

granular or waxy masses, which are usually solitary, sometimes 2 in each cell, and erect or pendulous, the pairs (or fours) from the adjacent cells of different anth. being attached by ped. (*appendages*) to glands (*corpuscles*) at each angle of the stigma; ov. superior, of 2 distinct carp., enclosed in staminal tube, with numerous ovules, styles 2, stigma 1, usually large, united with anth., 5-angled; fruit of 2 follicles; seeds numerous, compressed, with a long brush of hair (coma) at one end, embryo large, in copious endosperm.

The thirty-nine species of this Family are all inhabitants of the low country, with the exception of 2 species of *Tylophora* and 2 of *Ceropegia* confined to the Hills; seven other species also extend upwards into the montane zone. The majority are dry-country plants exclusively, as *Secamone*, *Oxystelma*, *Pentatropis*, *Holostemma*, *Marsdenia*, *Cosmostigma*, *Leptadenia*, and *Caralluma;* the rest occur in both moist and dry regions, only two, *Dregea* and *Dischidia*, being confined to the former. Only eight species are endemic, belonging to the genera *Gymnema*, *Tylophora*, and *Ceropegia*.

The minute size and fleshy character of the column and corona render the examination of these flowers a matter of some difficulty.

Filaments distinct or very nearly so, pollen-masses 2 in each cell.	
Cor.-lobes valvate	1. HEMIDESMUS.
Cor.-lobes contorted.	2. CRYPTOLEPIS.
Filaments completely connate.	
Pollen-masses 2 in each anth.-cell.	
Cor.-lobes oval; stigma short, bifid . .	3. SECAMONE.
Cor.-lobes linear; stigma long, fusiform .	4. TOXOCARPUS.
Pollen-masses solitary in each anth.-cell.	
Anth. with a membranous inflexed tip.	
Pollen-masses pendulous.	
Corona double, corolline and staminal .	5. OXYSTELMA.
Corona single, corolline or staminal.	
Stem erect	6. CALOTROPIS.
Stem twining.	
With leaves.	
Corona staminal, of 5 vertical processes.	
Cor. rotate	7. PENTATROPIS.
Cor. funnel-shaped . . .	8. DÆMIA.
Corona corolline, annular or cupular.	
Fl. large; follicles thick, obtuse	9. HOLOSTEMMA.
Fl. small; follicles narrow, tapering	10. CYNANCHUM.
Leafless	11. SARCOSTEMMA.
Pollen-masses erect.	
Corona corolline	12. GYMNEMA.

Corona staminal.
Cor.-lobes more or less contorted.
Cor. campanulate . . . . . 13. MARSDENIA.
Cor. rotate.
Coronal processes fleshy, thick . 14. TYLOPHORA.
Coronal processes scale-like, bifid 15. COSMOSTIGMA.
Coronal processes with a large inflexed tooth above . . 16. DREGEA.
Cor.-lobes valvate.
Cor. urceolate . . . . . . 17. DISCHIDIA.
Cor. rotate.
Leaves thick . . . . 18. HOYA.
Leaves thin . . . . . . 19. HETEROSTEMMA.
Anth. without a membranous, inflexed tip.
Stems twining, slender, cylindrical.
Cor. rotate . . . . 20. LEPTADENIA.
Cor. tubular . . . . 21. CEROPEGIA.
Stems erect, thick and fleshy, quadrangular . . . . . . 22. CARALLUMA.

1. HEMIDESMUS, *Br.*

A semi-shrubby twiner, fl. small, cymes axillary; cal.-segm. 5, very deep, imbricate; cor. rotate, thick, tube very short, with 5 ridges within, lobes 5, valvate; stam. inserted at very base of cor.-tube, fil. quite distinct, slender, anth. small, connectives prolonged, covering over stigma, pollen-masses granular, 2 in each cell; stigma 5-angled, flat on top, corpuscles with hooded appendages; follicles linear, slightly falcate, terete, acuminate, smooth; seeds oblong, with long coma.—Monotypic.

H. indicus, *Br. in Ait. Hort. Kew. ed.* 2, ii. 75 (1811). **Iramusu,** *S.* **Nannari,** *T.*

Burm. Thes. 187. Fl. Zeyl. n. 113. *Periploca indica*, L. Sp. Pl. 211. Moon Cat. 20. Thw. Enum. 195. C. P. 183, 1864.

Fl. B. Ind. iv. 5. Burm. Thes. t. 83, f. 1. Wight, Ic. t. 594. Bentl. & Trim. Med. Pl. t. 174.

Perennial, with a woody rootstock and numerous very long prostrate or ascending stems, slightly twining, cylindrical, pubescent, often semi-woody at base, thickened at nodes; l. very variable, from oblong-oval to linear, acute or rounded at base, subacute or retuse at apex, apiculate, usually slightly pubescent on veins and margin, pale and shining beneath, veins reticulate, pellucid, petiole very short; fl. on short ped., crowded, bracts numerous, ovate, acute; cal.-segm.

ovate, acute, slightly ciliate; cor. about $\frac{1}{3}$ in. diam., lobes oval, very acute, wrinkled within; follicles 4–5 in.

Low country up to 2500 ft. or higher, in grassy places, very common. Fl. Feb.; dull purple, green outside.

Throughout Peninsular India.

Remarkably variable in the form of the leaves, which have often a white variegation on the upper surface. C. P. 1864, from Jaffna (Gardner), has very obtuse emarginate apiculate leaves, undulated on the margins, but looks like some diseased state.

The roots are much used as a tonic medicine, and the plant hence called 'Sarsaparilla' by the English. They are included in both the British and Indian official Pharmacopœias. When fresh they have a pleasant scent.

2. **CRYPTOLEPIS,** *Br.*

Twining shrub, fl. moderate-sized, cymes axillary, branched; cal. with 5 minute scales within, segm. 5, deep; cor. with short tube, lobes 5, narrow, contorted, corona corolline, of 5 processes above middle of tube; stam. inserted at base of cor.-tube, fil. short, broad, very slightly connate at base, anth. small, tips acuminate, connivent above the stigma, pollen-masses granular, 2 in each cell; stigma short, conical; follicles short, terete, divaricate; seeds compressed, with very long coma.—Sp. 14; 3 in *Fl. B. Ind.*

C. Buchanani, *Roem. & Schult. Syst.* iv. 409 (1819). **Wel-rukattana,** *S.*

Thw. Enum. 195. C. P. 2548.

Fl. B. Ind. iv. 5. Wight, Ic. t. 494.

A rather large shrubby twiner, branches cylindrical, glabrous, dilated at nodes; l. 3–4 in., oval-oblong, rounded or subacute at base, very suddenly narrowed into a short mucronate apex, quite glabrous, paler beneath, lat. veins numerous, fine, horizontal, parallel, united by an intramarginal one, petiole $\frac{1}{4}$–$\frac{3}{8}$ in.; fl. on glabrous ped., cymes short, paniculate, bracts small, mucronate, with scarious borders, buds pointed; cal. glabrous, segm. oval, subacute; cor. $\frac{3}{4}$ in. diam., lobes linear-oblong, subacute, follicles $2\frac{1}{2}$–$3\frac{1}{2}$ in., tapering to blunt point, somewhat dorsally compressed, glabrous; seeds narrowed to apex, dull brownish-black.

Low country to 3000 ft., rather common. Fl. May–Sept.; pale green.

Throughout India and Burma.

The wood is used in native medicine.

Cryptostegia grandiflora, Br., a native probably of Trop. Africa, is much grown in gardens near the coast, and in the dry districts, as Jaffna, Puttalam, &c., and is often found near the shore in a semi-wild state.

3. SECAMONE, *Br.*

A diffuse semi-shrubby perennial, fl. very small, cymes small, paniculate; cal.-segm. short, rounded, imbricate; cor. rotate, lobes 5, oval, saccate at base, contorted; fil. connate, broad, pollen-masses waxy, 2 in each cell; corona staminal, of 5 processes adnate to column; stigma short, bifid, corpuscles very small; follicles plano-convex, tapering, divaricate; seeds narrow, compressed, coma long.—Sp. 24; 1 in *Fl. B. Ind.*

S. emetica,* *Br. in Mem. Wern. Soc.* i. 56 (1811).
Thw. Enum. 195. C. P. 1851.
Fl. B. Ind. iv. 36. Wight, Ic. t. 1283.

Stems numerous, slightly twining, slender, wiry, glabrous, cylindrical, much thickened at nodes; l. 2–2½ in., linear-lanceolate or linear, acute at base, tapering and very acute at apex, glabrous, petiole short, slender; fl. on slender pubescent ped., cymes stalked, lax, dichotomous, bracts small, woolly-pubescent; cal. pubescent, segm. ciliolate; cor. under ¼ in. diam., lobes oblong-oval, obtuse; follicles 2–3 in., much acuminate, smooth.

Dry and intermediate country below 2000 ft., rather rare. Jaffna; Puttalam; Kurunegala; Hangurankette. Fl. June, July; yellow.
Also in S. India.

4. TOXOCARPUS, *W. & A.*

Shrubby twiner, fl. moderate-sized, cymes paniculate; cal. very small, segm. 5, narrow; cor. with short tube, lobes 5, oblong-linear, recurved, contorted; fil. connate, anth. small, pollen-masses very small, waxy, 2 in each cell, corona staminal, of 5 processes produced into acute erect tongues above the column; stigma thick, with a long fusiform erect appendage extending much beyond the column; follicles divaricate, smooth.—Sp. 14; 8 in *Fl. B. Ind.*

T. Kleinii, *W. & A. Contrib.* 61 (1834).
Thw. Enum. 195. C. P. 2578.
Fl. B. Ind. iv. 14. Wight, Ic. t. 886.

A twining shrub, stems long, more or less tomentose with rufous hair; l. 2–2½ in., lanceolate or oval, acute at base, shortly acuminate, glabrous above, usually rusty-pubescent beneath, thick, petiole ⅜–½ in., fl. on ped., cymes usually shorter than l.,

---

* Said by Thunberg to be used as an emetic in India.

with very divaricate branches, rusty-pubescent; cal. densely rufous-hairy, lobes oblong, obtuse or acute; cor.-lobes narrowly strap-shaped, obtuse, twice as long as tube, much recurved; follicles not seen, '3–7 in., slightly curved, glabrous; seeds $\frac{1}{3}$ in., ovate, scarcely beaked.'

Low country, up to 3000 ft., but chiefly in the dry region; rather rare. Bintenne District; Kekirawa, N.C. Prov.; Hangurankette; Maturata; Galle (Champion). Fl. Nov.–March; yellowish-green, brown outside; sweet-scented.

Also in S. India.

Variable in foliage; the narrow leaves are usually quite glabrous beneath.

5. OXYSTELMA, *Br.*

Perennial twiner, l. narrow, fl. large, cymes racemose, lax; cal.-segm. 5, very deep, cor. shallowly campanulate, lobes broadly triangular, ovate, subacute, ciliate, valvate below, the tips imbricate, corolline corona annular, truncate; column large, stam. 5, fil. connate, short, anth. with connective produced into an inflexed membranous tip, pollen-masses 1 in each cell, pendulous, staminal corona of 5 processes which are large, broad and inflated at base, tapering to a sharp point, exceeding anth. and curved over stigma; stigma large, flat-topped; follicles divaricate, narrowly ovoid, compressed, slightly winged on edges; seed ovate, compressed, coma long. —Sp. 4; 1 in *Fl. B. Ind.*

O. esculentum,* *Br. in Mem. Wern. Soc.* i. 40 (1811). **Kulappalai,** *T.*

Periploca esculenta, L. f. Suppl. Pl. 168. Moon Cat. 20. Thw. Enum. 196. C. P. 2837.

Fl. B. Ind. iv. 17. Hook. Comp. Bot. Mag. ii. t. 22. Roxb. Cor. Pl. t. 11 (*Periploca*).

A perennial herb, roots fibrous, from the lower nodes, stems numerous, long, much branched, slender, twining, quite glabrous; l. 2–3 in., lanceolate-linear, rounded at base, tapering to very acute apex, glabrous, thin, pale green, venation pellucid, petiole $\frac{3}{8}$ in., slender; fl. large, drooping, on long slender ped., which are thickened upwards, cyme from between the petioles, 3- or 5-fld., lax, racemose, long-stalked, much exceeding l., bracts minute; cal.-segm. lanceolate, acute, glabrous, thin; cor. $\frac{3}{4}$–1 in. diam., lobes rather shallow, ovate-triangular; column prominent, fil. very broad; follicles $2\frac{1}{2}$ in., somewhat falcate, a little inflated, smooth (one often abortive).

---

* Kœnig states that it is eaten.

By or in the borders of tanks, paddy fields, and streams in the dry country; rather common. Fl. Dec.–March; pale cream-coloured, veined and stained with purplish-pink, column white.

Also in India, Burma, and Java.

Originally described from Kœnig's specimens. Linn. fil. (l. c.) gives the name 'Usepale' as that used in Ceylon. This is one of our most beautiful plants, with its masses of large cup-shaped flowers drooping over the water, in or by which it always grows. It would be well worth cultivation, and is fond of clambering over old stumps, but does not climb to any height. I never heard of any part being eaten here, but it is employed by the native doctors as a remedy in hydrophobia. Has a milky juice.

6. CALOTROPIS, *Br.*

Erect shrub, l. broad; fl. large, cymes umbellate, extra-axillary; cal. of 5 distinct sep.; cor. rotate or slightly cup-shaped, lobes 5, very deep, spreading, valvate; column very large and conspicuous, fil. completely connate; pollen-masses 1 in each cell, pendulous, flattened; coronal processes very large, erect, compressed, standing out as wide buttresses from the column, with a large, thick, curved spur at the base, anth. narrow, with a membranous inflexed tip; stigma large, flat on top, sharply 5-angled; follicles short, broad, thick; seeds ovate, compressed, coma long.—Sp. 3; all in *Fl. B. Ind.*

C. gigantea, *Br. in Ait. Hort. Kew., ed.* 2, ii. 78 (1811). **Wara,** *S.* **Manakkovi, Errukalai, Urkkovi,** *T.*

Herm. Mus. 34. Burm. Thes. 24. Fl. Zeyl. n. 112. *Asclepias gigantea*, L. Sp. Pl. 214. Moon Cat. 20. Thw. Enum. 196. C. P. 1831. Fl. B. Ind. iv. 17. Wight, Ill. t. 155. Bot. Mag. t. 6862.

An erect shrub or small tree, reaching 10 ft., bark yellowish-white, furrowed, branches stout, cylindrical, more or less covered with a very fine, adpressed, cottony pubescence; l. nearly sessile, large, 4–8 in., oval-oblong or slightly obovate, cordate at base, acute, rather thick, glaucous green, covered with a very fine cottony tomentum which is easily removed and is naturally deciduous on upper surface; fl. large, on long stout ped., cymes bifurcate, irregularly subumbellate, peduncles long, stout, coming off from between the leaves (not axillary), bracts small, acuminate, deciduous; sep. oval, acute, cottony; cor. $1\frac{1}{2}$–$1\frac{3}{4}$ in. diam., lobes triangular-oblong, subacute; follicles $3\frac{1}{2}$–4 in., broad, thick, fleshy, somewhat corrugated, glabrous, seeds very numerous.

Waste ground and roadsides, &c., in the low country; very common, and often gregarious. Fl. all the year; pale violet or nearly white within, greenish-white outside, column pale blue.

Throughout India, Malaya, S. China.

Has a slightly fetid odour when bruised. The whole plant is very full of milky juice, which is given as a remedy for leprosy. The bark of the root (which is an official drug in the Indian Pharmacopœia) is employed as an alterative tonic. A very good fine fibre is obtained from the stem and used for fishing lines. The long hairs on the seed form a beautiful silk-cotton, used for stuffing. Charcoal for gunpowder is made from the stems at Jaffna.

Asclepias curassavica, L., a native of the W. Indies, is not uncommon as a roadside weed, and is quite naturalised. This is often called 'Wild Ipecacuanha' by the English, though not used here, as in its native country, as a substitute for that medicine.

7. PENTATROPIS, *Br.*

Twining perennial, l. broad; fl. rather small, cymes sub-umbellate; cal. very small, segm. 5, very deep; cor. rotate, lobes 5, very deep, narrow, contorted; column large, prominent, fil. short, connate, pollen-masses 1 in each cell, not compressed, pendulous, coronal processes vertically adnate to column, compressed, spurred at base; stigma flat on top, slightly 5-angled; follicles small, pointed, glabrous; seeds with long coma.—Sp. 8; 2 in *Fl. B. Ind.*

P. microphylla, *W. & A. Contrib.* 52 (1834).
Cynanchum acuminatum, Thunb. Obs. in Cynanch. 5. Thw. Enum. 196. C. P. 1853.
Fl. B. Ind. iv. 20. Wight, Ic. t. 352.

A perennial herb, often slightly woody at base, stems twining, very slender, thickened at nodes, glabrous; l. small, $\frac{3}{4}$–1 in., broadly oblong or ovate-oval or subrotundate, obtuse but mucronate at apex, glabrous, petiole $\frac{1}{6}$–$\frac{1}{4}$ in., slender; fl. on filiform ped. $\frac{1}{2}$ in. long, cymes very short, bracts small, imbricate; cal.-segm. linear-lanceolate, acute; cor.-lobes narrowly triangular, acute; follicles about $1\frac{1}{2}$ in., tapering to long point; valves much everted after dehiscence.

Dry and intermediate region; rather rare. Jaffna; Puttalam; Kurunegala. Fl. August.

Also in India and Burma.

Much like *Tylophora tenuis* in general appearance.

8. DÆMIA, *Br.*

Twining perennial, l. cordate, fl. moderate-sized, cymes corymbose, long-stalked; cal. cleft to base into 5 sep.; cor.-tube short, broadly funnel-shaped, lobes 5, ovate, contorted; column large, prominent, fil. long, connate, corona shortly

tubular, crenately lobed and with 5 large, vertical, adnate processes spurred at base and with subulate points prolonged over stigma, pollen-masses 1 in each cell, pendulous, slightly compressed; stigma flat on top; follicles tapering to long beak, covered with soft spines; seeds with long coma. Sp. 6; 1 in *Fl. B. Ind.*

D. extensa, *Br. in Ait. Hort. Kew., ed.* 2, ii. 76 (1811). **Médahangu,** *S.* **Uttamakam, Veliparatti,** *T.*

Cynanchum echinatum, Thunb. Obs. in Cynanch, 8. *Gomphocarpus volubilis*, Moon Cat. 20. Thw. Enum. 196. C. P. 1841.

Fl. B. Ind. iv. 20. Wight, Ic. t. 596. Bot. Mag. t. 5704 (*Raphistemma ciliatum*).

A perennial herb, stems twining, more or less hispid, with short spreading hair and minute prickles; l. 2–4 in., and nearly as broad, deeply cordate at base, with rounded lobes, acute, slightly hairy on both sides, ciliate, thin; fl. on long, slender, pubescent ped., cymes at first corymbose, afterwards racemose, peduncles coming off from between the bases of petioles, much longer than l., bracts linear, acute; sep. lanceolate, acute, slightly ciliate; cor. nearly ¾ in. diam., lobes acute, hairy above, ciliate, concave, spreading; follicles 2–2½ in., reflexed, long-beaked, spines long, soft.

Low country; rather common, especially in the dry districts. Fl. Feb.–May; pale green.

Also in India and Affghanistan.

Has a slightly fetid odour when bruised. The plant, which has emetic properties, is given as an expectorant in bronchitis, &c.

9. HOLOSTEMMA, *Br.*

Semi-shrubby twiner, l. cordate, fl. large, cymes axillary, corymbose, cal. divided to base into 5 sep.; cor. subrotate, thick, lobes 5, divided ⅔ down, broad, concave, valvate, coralline corona annular, slightly lobed; column prominent, stam. 5, fil. connate, broad, anth. very large, winged on the back; tips membranous, incurved over stigma, pollen-masses 1 in each cell, narrow, compressed, pendulous on long black pedicels; staminal corona 0; stigma large, prominently 5-angled; follicles thick, obtuse; seeds comose.—Sp. 2; 1 in *Fl. B. Ind.*

H. Rheedei, *Wall. Cat. n.* 4469 (1828).

Trim. in Journ. Bot. xxvii. 164. C. P. 3582.

Fl. B. Ind. iv. 21. Wight, Ic. t. 597.

A rather large perennial, woody at the base, stems twining, much branched, glabrous and shining; l. rather large, 3–5 in.,

oblong-ovate, cordate at base, with rounded lobes, suddenly acute at apex, glabrous above, pubescent on veins beneath, rather thick, venation reticulate, conspicuous, pellucid, petiole 1–1½ in., stout; fl. few, on long stout ped., cymes pedunculate, glabrous, bracts minute; sep. oval, obtuse, glabrous; cor. 1–1½ in. diam., lobes broadly ovate-oval, obtuse, glabrous; follicles (one usually suppressed) 5–6 in., fusiform-oblong, blunt, cylindrical, with a deep furrow along each side, fleshy.

Dry country; very rare. About Nilgala, Bibile, &c., Uva Province. Fl. Jan.; purplish-crimson, pale pink outside.

Throughout India and Burma.

A handsome, large-flowered species. Since recording this in Journ. Bot. I have found in the collection of drawings an unnamed sketch of the fruit, collected at Nilgala in 1858, and in the herbarium (also unnamed), under C. P. 3582, are some leaves from the same locality. This C. P. number is not referred to by Thwaites in his Enum.

10. **CYNANCHUM,** *L.*

Herbaceous twiner, fl. rather small, cymes umbellate; cal.-segm. 5, narrow, acute; cor. rotate, lobes 5, very deep, oblong, valvate; corolline corona large, tubular, 5-lobed, adnate to base of column; column exserted, stam. 5, connate, fil. short, broad, anth. with erect membranous tips, pollen-masses 1 in each cell, not compressed, pendulous, no staminal corona; follicles narrow, tapering; seeds comose.—Sp. 100; 16 in *Fl. B. Ind.*

C. pauciflorum, *Br. in Mem. Wern. Soc.* i. 45 (1811). **Kaṇ-kumbala,** *S.*

C. pedunculatum, Thunb. Obs. in Cynanch. 6(?). *Hoya alexiaca*, Moon Cat. 21 (? Willd.). *Cynoctonum pauciflorum*, Dcne., Thw. Enum. 195. C. P. 2466.

Fl. B. Ind. iv. 23. Wight, Ic. t. 354.

Stem slender, twining, with long internodes, glabrous; l. 1½–3½ in., ovate or oblong-ovate, usually cordate at base, with rounded lobes, very acute at apex, glabrous, thin, petiole long, slender (usually there is a pair of rounded l. in axil—the first pair of an arrested branch—looking like stipules); fl. on rather long ped., cymes on short peduncles; cor. under ½ in. diam., corona as long as cor., plicate; follicles divaricate in a straight line, 2½–3 in., fusiform, much tapering to blunt point, smooth and glabrous.

Moist region, up to 4000 ft.; common. Fl. Jan.–March; pale purple.

Also in South India.

Thunberg's description of '*C. pedunculatum*' does not quite agree

with this species, which is, however, very variable. A plant from Maturata has very narrow, slightly hairy leaves, and may be another species. Moon refers Willdenow's *Asclepias alexiaca* (from Ceylon) to this. Used in native medicine.

11. **SARCOSTEMMA,** *Br.*

Straggling leafless perennial, fl. rather small, cymes axillary, umbellate; cal. small, segm. 5; cor. rotate, lobes very deep, contorted; column somewhat depressed, stam. 5, connate, fil. very short, anth. broad, tip short, inflexed, pollen-masses 1 in each cell, narrow, pendulous, corona annular, lobed, and with 5 large, erect, fleshy, acute processes adnate to and nearly concealing anth.; stigma bluntly conical; follicles linear; seeds comose.—Sp. 5 or 6; 4 in *Fl. B. Ind.*

S. Brunonianum, *W. & A. Contrib.* 59 (1834). **Muwa-kiriya,** *S.*
S. viminale, Moon Cat. 20 (? Willd.). Thw. Enum. 196. C. P. 1830. Fl. B. Ind. iv. 27 Wight, Ic. t. 1282. Bot. Mag. t. 6002.

A perennial herb, often semi-shrubby at base, stems very long, slender, cylindrical, jointed, fleshy, glabrous, dark green, scrambling over other plants but scarcely twining, divaricately branched; l. none; cymes at the nodes, fl. on short puberulous ped.; cal.-segm. acute, pubescent; cor. about ½ in. diam., lobes oblong-oval, obtuse or subacute, margin revolute; follicles 3½ in., gradually tapering to sharp point, glabrous.

Low country; very common in the dry and desert region, rarer in the moist districts. Fl. July, August; pale green.
Also in S. India.
The juice of the stem is watery and acid to the taste.

12. **GYMNEMA,** *Br.*

Twining perennials, shrubby at base, cymes umbellate or corymbose, fl. small; cal.-segm. (almost separate sep.) 5, obtuse; cor. sub-rotate or urceolate, tube long or short, lobes 5, slightly contorted, corolline corona of 5 scales or plates in throat or tube of cor.; stam. 5, connate, anth. with membranous tips, pollen-masses 1 in each cell, erect, pedicellate, not compressed, no staminal corona; stigma large, conical or clavate, exserted; follicles terete, smooth; seeds comose.—Sp. 25; 15 in *Fl. B. Ind.*

Cor.-tube short, with coronal scales free in the throat.
Follicles slender, pointed.
L. under 2 in., ovate . . . . . . 1. G. SYLVESTRE.
L. over 3 in., rotundate . . . . . 2. G. ROTUNDATUM.
Follicles oblong-ovoid, blunt . . . . 3. G. LACTIFERUM.
Cor.-tube long, with coronal processes adnate to tube . . . . 4. G. PERGULARIOIDES.

1. **G. sylvestre,** *Br. in Mem. Wern. Soc.* i. 33 (1811). **Mas-bedde,** *S.*

Periploca sylvestris, Retz., Willd. Sp. Pl. i. 1252. Moon Cat. 20. Thw. Enum. 197. C. P. 2549.

Fl. B. Ind. iv. 29 & 31. Wight, Ic. t. 349.

A woody twiner, covering high trees, branches very numerous, rather slender, cylindrical, softly and shortly hairy; l. rather small, $1\frac{1}{4}$–2 in., ovate, rounded at base, shortly acuminate, acute, hairy on the veins, especially beneath, petiole $\frac{1}{4}$ in., hairy; fl. on rather long, slender, hairy ped., cymes short, peduncle shorter than petiole, bracts numerous, minute, hairy; cal.-segm. ovoid, rounded or obtuse, hairy; cor. about $\frac{1}{6}$ in. diam., lobes about as long as tube, acute, recurved, coronal scales in throat of cor., fleshy, blunt, produced downwards as double ridges on the tube; column small; stigma ovoid, prominent, follicles small (one usually suppressed), $1\frac{1}{2}$–2 in., slender, tapering.

Var. β, **zeylanicum,** *Hk. f. Fl. B. Ind. l. c.* Var. *Decaisneanum*, Thw. l. c. C. P. 1844.

L. usually rather larger, finely velvety-tomentose on both sides; fl. rather larger and more numerous in dense crowded cymes.

Low country, rather common, especially in the dry and intermediate regions; var. β the common form. Fl. Nov.–Feb., June; pale yellow.

Also in S. India and Trop. Africa, var. β perhaps endemic.

I am doubtful as to the S. name; Moon gives none. The stems are used in native medicine. The Fl. B. Ind. does not credit Ceylon with the type of this species; and C. P. 2549 is there quoted as var. *Thwaitesii* of *G. lactiferum.* Probably there may have been some accidental transfer of tickets between this and C. P. 1847 in the Herbarium at Kew. *G. Decaisneanum*, Wight (Ic. t. 1271), of the Nilgiris is put in Fl. B. Ind. with *G. hirsutum*, W. & A.

2. **G. rotundatum,** *Thw. Enum.* 197 (1860).

C. P. 3086.

Fl. B. Ind. iv. 30.

Branches stout, finely tomentose; l. 3–4 in., ovate-rotundate, bluntly acuminate, slightly hairy above, more so beneath, petiole 1 in. or more, tomentose, glandular at top; cymes on a short peduncle, bifid, fl. numerous; cal.-segm. oblong-obtuse,

ciliate; cor. nearly $\frac{1}{4}$ in. diam., lobes acute, recurved; follicles nearly 3 in., linear, glabrous.

Dry and intermediate regions; rare. Hanguranketa; Nalande; Anuradhapura. Fl. Nov.–Feb.; yellow.

Endemic.

I doubt this being more than a large form of *G. sylvestre.*

3. **G. lactiferum,** *Br. in Mem. Wern. Soc.* i. 33 (1811). **Kurinnan,** *S. & T.*

Herm. Mus. 17. Burm. Thes. 24. Fl. Zeyl. n. 111. *Asclepias lactifera,* L. Sp. Pl. 216. *G. zeylanicum,* Decaisne, DC. Prod. viii. 622. Thw. Enum. 198. Wight, Contrib. 44. C. P. 2580.

Fl. B. Ind. iv. 30.

A straggling semi-twining shrub, stems rather stout, glabrous, the younger branches often pubescent; l. 2–4$\frac{1}{2}$ in., oval, acute at base, acuminate, acute, glabrous or slightly pubescent on the veins beneath, rather thick, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., pubescent; fl. pedicellate, cymes umbellate, shortly stalked, roundish; cal.-segm. broadly oval, rounded, pubescent, margins more or less membranous; cor. about $\frac{1}{4}$ in. diam., lobes acute, finely ciliolate; follicles (? ripe) 2$\frac{1}{2}$ in., by $\frac{3}{4}$ in. wide, oblong-ovoid, blunt.

Var. β, **Thwaitesii,** *Hk. f. l. c.* C. P. 1847.

Leaves softly pubescent beneath.

Low country up to 3000 ft., rather common in the moist region, rare in the dry districts. Summit of Ritigala, N. C. Prov. Var. β, Colombo; Maturata. Fl. July–Nov.; yellow.

Also in Khasia and Malaya. Not in Peninsular India.

The Fl. B. Ind. quotes C. P. 2549 instead of C. P. 1847 for var. β (as to which see *G. sylvestre*). Var. *Walkeri,* Hk. f., I have not seen, nor does it seem from description to differ from the type materially. This is the 'Cow-plant' of Ceylon, of which many fables have been written,* based on the erroneous observation of Hermann that its milky latex is a substitute for the milk of the cow. He calls it 'Kirianghuna,' which is usually now applied to *Dregea volubilis.* Moon does not appear to have known it. The leaves are believed to increase the secretion of milk, and are given as a vegetable after child-birth.

4. **G. pergularioides,** *Wight & Gardn. in Thw. Enum.* 198 (1860).

Cynanchum cuspidatum, Thunb. Obs. in Cynanch. 5 (?). *Bidaria pergularioides,* Thw. Enum. 198. C. P. 2671.

Fl. B. Ind. iv. 32.

A twining shrub, branches much elongated, slender, hairy; l. 2–4 in., oblong-ovate, rounded at base, much acuminate, subacute, glabrous or slightly pubescent on both sides, thin, pale beneath, with conspicuous venation, petiole $\frac{1}{2}$ in., slender; fl. on short nearly glabrous ped., cymes umbellate, globose,

* See Tennent, 'Ceylon,' i. pp. 101, 102, foot-note.

peduncle about as long as petiole; cal.-segm. oblong-oval, obtuse; cor.-tube thrice as long as cal.-segm., lobes as long as tube, oblong-lanceolate, acute, spreading or recurved, corona of 5 fleshy ridges in the cor.-tube; follicles not divaricate, 4½–6 in., cylindrical, tapering to long sharp point.

Var. β, **Gardneri,** *Hk. f. l. c.* C. P. 1848.

L. smaller, 1–2 in., oval, shortly acuminate, thicker; fl. rather smaller; cal.-segm. lanceolate, acute, nearly as long as cor.-tube; follicles shorter, 2½–3 in.

Var. γ, **stenoloba,** *Hk. f. l. c.* (sp.) C. P. 2672.

L. larger, 3–6 in., glabrous, very membranous; fl. fewer and larger; cor.-lobes longer than tube, narrowly linear; follicles as in the type.

Moist region from 2000–6000 ft.; rather rare. Deltota; Dimbula. Var. β, Adam's Peak; N. Eliya. Var. γ, Ambagamuwa. Fl. Jan.–April, August; greenish-yellow or pink.

Endemic.

I do not think var. *stenoloba* deserves the specific rank accorded it in Fl. B. Ind.

13. MARSDENIA,* *Br.*

Large shrubby twiner, fl. rather small, numerous, cymes large, paniculate, axillary; cal.-segm. 5 (almost distinct sep.); cor. sub-campanulate, lobes 5, obtuse, contorted; stam. 5, connate, anth. with inflexed tip, pollen-masses 1 in each cell, stalked, oblong, erect, corona staminal, of 5 flat, erect, scales adnate to back of anth.; stigma large, convex; follicles large, fusiform; seeds with long coma.—Sp. 50; 11 in *Fl. B. Ind.*

M. tenacissima, *Moon Cat.* 21 (1824). **Muruva-dul,** *S.*
Thw Enum. 197. C. P. 2860.
Fl. B. Ind. iv. 35. Wight, Ic. t. 590, copied from Roxb. Cor. Pl. t. 240 (*Asclepias*).

Twining shrub, branches very stout, bluntly angular, densely velvety and hairy; l. very large, 6–7 in. and nearly as wide, deeply cordate, with rounded lobes at base, shortly acuminate, acute, softly velvety on both sides or nearly glabrous above, petiole about 3 in., softly hairy; fl. on rather long hairy ped., cymes much branched, hairy; cal.-segm. oblong, hairy, cor. velvety outside, lobes as long as tube, oblong, obtuse, spreading; follicles 6 in., tapering to point, smooth.

---

* In honour of William Marsden, F.R.S., author of the 'History of Sumatra.' Died in 1836.

Dry and intermediate country, rare. Kurunegala; Uma-oya; Ekiriankumbura. Fl. June, July; greenish-yellow.

Also in Kumaon, Bengal, Burma, and Timor.

The stems afford a very strong silky fibre, the milky juice contains much caoutchouc, and the leaves are given in medicine as a remedy for flatulence.

14. TYLOPHORA, *Br.*

Twining (rarely erect) perennials, often semi-shrubby at base; fl. small or very small, on long ped., in umbellate clusters, which are usually arranged in slender axillary cymes; cal.-segm. (nearly distinct sep.) 5, acute; cor. rotate, lobes 5, slightly contorted; column small, stam. 5, connate, fil. short, anth. usually very small (larger in *T. Iphisia*), with a short inflexed tip, pollen-masses minute, 1 in each cell, erect (rarely horizontal), coronal processes thick and fleshy, adnate to back of stam.; stigma 5-angled, not exserted; follicles tapering to long point, glabrous; seeds flat, with long coma.—Sp. 40; 23 in *Fl. B. Ind.*

Stem short, erect or slightly twining.
  Sep. linear-lanceolate . . . . . . 1. T. FASCICULATA.
  Sep. ovate . . . . 2. T. IPHISIA.
Stem long, much twining.
  Fl. very small; coronal processes wholly adnate to stam.
    L. over $2\frac{1}{2}$ in., acute.
      L. very thin; cymes about as long as l. 3. T. MEMBRANIFOLIA.
      L. rather fleshy; cymes exceeding l. . 4. T. ZEYLANICA.
    L. under $1\frac{1}{2}$ in., obtuse . . . . . 5. T. TENUIS.
  Fl. larger; coronal processes with free points.
    Fl. solitary or in twos . . . . . 6. T. CORDIFOLIA.
    Fl. numerous.
      More or less hairy . . . . . . 7. T. ASTHMATICA.
      Quite glabrous . . . . . . 8. T. FLAVA.

1. **T. fasciculata,** *Ham. in Wight, Contrib.* 50 (1834).
Thw. Enum. 424. C. P. 3792.
Fl. B. Ind. iv. 40 (not given for Ceylon). Wight, Ic. t. 848.

Stems several, erect, 12–18 in., nearly simple, very slightly twining, pubescent; l. small, $1–1\frac{1}{2}$ in., rather crowded, ovate or oblong-lanceolate, rounded or acute at base, acute, glabrous above, pubescent on veins beneath, petiole $\frac{1}{4}$ in., slender, pubescent; fl. small, on rather long, slender, pubescent ped., cymes racemose, shorter than l., shortly stalked, erect, bracts filiform; sep. linear-lanceolate, acute; cor.-lobes broadly oval, acute, coronal processes globose; follicles fusiform (not seen ripe).

Lower montane zone, very rare. Only found at Mutetuwegama, near Balangoda in 1863 by Thwaites. Fl. April.

Also in Nepal and Concan.

2. **T. Iphisia,** *Decaisne in DC. Prod.* viii. 610 (1844).
Thw. Enum. 424 and (*T. fasciculata*) 197. C. P. 369.
Fl. B. Ind. iv. 40. Wight, Ic. t. 1276.

Stems flexuose, slightly twining, glabrous, l. 1–2½ in., oblong-ovate, rounded at base, acuminate, very acute or apiculate, glabrous, thin, venation conspicuous beneath, fl. small, on long slender ped., cymes branched irregularly, racemose; sep. ovate, acute; cor.-lobes broadly oval, obtuse; column conspicuous, anth. large, coronal processes large, ovoid, fleshy, pollen-masses horizontal or slightly pendulous; follicles 3 in., fusiform, point blunt; seed ⅜ in., ovate, coma over 1 in.

Upper montane zone, rather rare. N. Eliya; Dimbula; Haputale. Fl. April; purple or yellowish-purple.

Also in the Nilgiri Mts.

[*T. pauciflora*, W. & A. Wight, Ic. t. 1274. To this is referred, in Fl. B. Ind., Thwaites' *T. asthmatica*, var. *β*, *glabra*, but I think incorrectly. It is a native of S. India only.]

3. **T. membranifolia,** *Thw. Enum.* 424 (1864).
C. P. 3793.
Omitted in Fl. B. Ind.

Stems long, twining, quite glabrous; l. 2½–3 in., ovate, more or less cordate at base, suddenly acuminate, acute or mucronate, glabrous, very thin, petiole ¾–1 in., fl. small, on long filiform ped., cymes very slender, about as long as l., glabrous, flexuose; sep. broadly ovate, acute; coronal processes a little compressed laterally; follicles 2½ in., slender.

Low country, rare. Colombo (Ferguson); Nalande; Anuradhapura. Fl. Aug.–Nov.

Endemic.

Apparently this comes very near *T. pauciflora*, W. & A.

4. **T. zeylanica,** *Decaisne in DC. Prod.* viii. 608 (1844).
Cynanchum micranthum, Thunb. Obs. in Cynanch. 5. *T. micrantha*, Thw. Enum. 197. C. P. 2517.
Fl. B. Ind. iv. 42.

Stems long, stout, twining, glabrous; l. large, 3–5 in., broadly oval, rounded or subacute at base, shortly acuminate, acute, margin narrowly recurved, glabrous, rather thick and fleshy, midrib with a gland at the base above, lat. veins nearly horizontal, petiole 1–1¼ in., stout; fl. very small, numerous, on slender glabrous ped., cymes 4–6 in., longer than l., stalked, slender, branched; cal.-segm. deltoid-ovate, subacute, glabrous; cor.-lobes ovate, obtuse; column small, coronal processes

fleshy; follicles 4–5 in., narrow, cylindrical, long-pointed, slightly divaricate; seeds $\frac{3}{8}$ in., oblong, coma $1\frac{1}{4}$ in.

Moist region, 2000–4000 ft., rather rare. Hantane; Watagoda. Fl. July; purple.

Also in Travancore.

The follicles are copiously produced, and pendulous in clusters.

5. **T. tenuis,** Bl. Bijd. 1062 (1826).

Asclepias dichotoma, Rottl. in Wall. Cat. n. 8200. *T. carnosa*, Wall. Wight, Contrib. 49. Thw. Enum. 196. C. P. 1852.

Fl. B. Ind. iv. 42. Wight, Ic. t. 351 (*T. carnosa*) and t. 588 (*T. tenuissima*).

Stem long, much branched, very slender, widely twining, glabrous; l. small, $\frac{1}{2}$–$1\frac{1}{4}$ in. (often larger on main stem), oblong-oval, obtuse at both ends, apiculate, glabrous, rather thick, petiole short; fl. very small, on long, slender, divaricate ped., cymes longer than l., pedunculate, very slender, simple or branched, glabrous; cal.-segm. lanceolate, acute, nearly glabrous; cor.-lobes triangular, acute; follicles 2–4 in., cylindrical, membranous, point sharp; seeds $\frac{1}{2}$ in., coma $\frac{3}{4}$ in.

Low country, especially in the dry region and near the coast, rather common. Fl. Dec.–Feb., July; purple. First collected at Colombo by Rottler.

Also in India, Burma, and Malaya.

6. **T. cordifolia,** *Thw. Enum.* 196 (1860).

C. P. 717.

Fl. B. Ind. iv. 44.

Stems long, slender, much branched, twining, glabrous, the young parts slightly pubescent; l. small, $\frac{1}{2}$–$1\frac{1}{2}$., oblong-ovate, cordate at base, obtuse but sharply apiculate, glabrous, stiff, petiole pubescent above; fl. rather large (for genus), on slender glabrous ped., solitary or two together at end of short glabrous peduncle from between the petioles; cal.-segm. ovate, subacute, glabrous; cor.-lobes ovate, acute, column small, coronal processes oblong, laterally compressed, produced above into free points; follicles $1\frac{1}{2}$–3 in., divaricate, membranous.

Moist region, 2000–4000 ft.; rather common. Ambagamuwa; Dolosbagie; Deltota. An outlying station is Ritigala Hill, N.C. Prov. Fl. Jan., July; purple.

Endemic.

7. **T. asthmatica,** *W. & A. Contrib.* 51 (1834). **Bin-nuga,** *S.* **Peypalai, Nancharapanchan,** *T.*

Herm. Par. Bat. 55; Mus. 52. Fl. Zeyl. n. 490. *Asclepias asthmatica*, L. f. Suppl. Pl. 171. *Hoya hirsuta*, Moon Cat. 21. Thw. Enum. 197. C. P. 1857.

Fl. B. Ind. iv. 44. Wight, Ic. t. 1277. Bentl. and Trim. Med. Pl. t. 177.

Roots many, long, fleshy; stems very long, slightly branched, strongly twining, pubescent or hairy; l. 1–2½ in. (larger on main stem), oblong-oval or rotundate, cordate or rounded at base, suddenly and very shortly acuminate or apiculate, nearly glabrous above, more or less densely pubescent beneath (at least when young), petiole ¼–½ in., pubescent; fl. large (for genus), on very long, hairy, filiform ped., numerous, in 2 or 3 nearly sessile umbels at end of short peduncle, bracts filiform, hairy; cal.-segm. lanceolate, very acute, coarsely hairy; cor. ½ in. diam., lobes ovate, acute, recurved; column prominent, coronal processes gibbous below, abruptly narrowed into free points; follicles 2–3½ in., divaricate or deflexed, slender, fusiform, glabrous; seeds ¼ in., broadly oval, coma ¾ in.

Low country, chiefly in the moist region up to 4000 ft.; rather common. Fl. Sept.–Feb.; greenish-purple.

Also in India, Burma, Malaya, and Mauritius.

There is a specimen (without ticket or number) in Hermann's Herbarium and two drawings, but the plant was not taken up by Linnæus. Linn. f.'s description was from Ceylon specimens of Kœnig's, whose (MS.) name, *Asclepias vomitoria*, is frequently given by old authors. *Cynanchum bracteatum*, Thunb. Cyn. 7, may be this. Hermann's S. name, 'Manughawæl,' would be now written Maha-nuga-wel.

The root is a valuable medicine, possessing all the properties of Ipecacuanha, and is often called by that name. The leaves also have the same properties, and are an official drug in the Indian Pharmacopœia.

8. **T. flava,** *Trim. in Journ. Bot.* xxiii. 239 (1885). **Mudu-binnuga,** *S.* [PLATE LXII.]

Cynanchum flavens, Thunb. Obs. in Cynanch. 7 (?). *T. asthmatica*, var. *β*, *glabra*, Thw. Enum. 197 (?). C. P. 1849 (?).

Stems prostrate, semi-shrubby at base, long, straggling and twining, quite glabrous; l. 2¼–4 in. (or more), ovate or ovate-oblong, more or less cordate at base, suddenly acuminate, acute, quite glabrous, thick and fleshy, glaucous yellowish-green, with the veins paler, petiole about ¼ in., glabrous; fl. large, infl. as in *T. asthmatica*, but peduncles rather shorter and cymes perfectly glabrous; cal.-segm. narrowly lanceolate, glabrous; cor. ⅝ in. diam., lobes shallow, ovate-oblong, sub-acute; coronal processes broad at base, tapering into triangular, incurved, free points; follicles rather over 3 in., divaricate, linear, cylindrical.

Sandy seashores; rare. Abundant on the west coast, S. from Colombo. Fl. Aug.–Nov.; greenish-yellow, often crimson in centre.

Endemic (?).

Our specimens of C. P. 1849 are scarcely sufficient to decide whether they should be here referred with certainty; but there is also a good

figure which seems to be this species. In Fl. B. Ind. the plant is put to *T. pauciflora*, W. & A., and to this latter name is also referred (in Index Kewensis) *Cynanchum bracteatum*, Thunb. *Cynanchum flavens*, Thunb., is almost certainly this, which Thunberg could scarcely miss collecting on the route he travelled, and he gives for it the S. name, 'Binnuga' (Bin-nuga).

Possibly a maritime variety of *T. asthmatica*, but very different in appearance.

15. **COSMOSTIGMA,** *Wight.*

Shrubby climber, fl. moderate-sized, cymes racemose, axillary; sep. 5, small; cor. rotate, lobes 5, contorted; column very short and broad, stam. 5, connate, fil. very short, anth. with a rounded membranous apex, pollen-masses 1 in each cell, clavate, erect, with long pedicel, coronal processes adnate to base of anth. only, scale-like, erect, truncate or bifid; stigma flat, very wide, 5-angled; follicles oval-oblong, bluntly pointed, smooth; seeds oval, compressed, broadly winged, with a coma.—Monotypic.

C. racemosum, *Wight, Contrib.* 42 (1834).
Thw. Enum. 197. C. P. 1854.
Fl. B. Ind. iv. 46. Wight, Ic. t. 591 and (*C. acuminatum*) t. 1270.

Stems stout, cylindrical, often lenticellate, glabrous; l. 3–5 in., ovate, cordate or rounded at base, acuminate, subacute, glabrous, petiole 1–1½ in.; fl. on rather long, thick, glabrous ped., cymes at first umbellate or corymbose, but lengthening out into racemes 2–2½ in. long, no bracts; sep. oval, obtuse, ciliolate; cor. about ½ in. diam., lobes ovate, obtuse; follicles 2½–3 in.; seed ⅜ in.

Low country; rather common. Hantane; Kurunegala; Anuradhapura. Fl. June; greenish-yellow speckled with red dots.

Also in India, Burma, and Java.

16. **DREGEA,** *E. Meyer.*

Large shrubby twiner, l. broad, fl. rather large, green, in umbellate axillary cymes; cal.-segm. 5, lanceolate; cor. rotate, lobes 5, broad, contorted; column small, stam. 5, connate, anth. with short inflexed tips, pollen-masses 1 in each cell, ovoid, erect, shortly stalked, coronal processes large, fleshy, adnate to upper part of column, with a fleshy tooth projecting inwards over the anth.; follicles divaricate, ovate-ovoid, hard, vertically grooved; seeds comose.—Sp. 6 or 7; 1 in *Fl. B. Ind.*

D. volubilis, *Benth. in Fl. B. Ind.* iv. 46 (1883). **Kirianguna,** *S.* **Kurincha,** *T.*

Asclepias volubilis, L. f. Suppl. Pl. 170. *Hoya viridiflora,* Br. in Mem. Wern. Soc. i. 27. Moon Cat. 21. Thw. Enum. 199. C. P. 1855.

Fl. B. Ind. iv. 46. Wight, Ic. t. 586.

A large twining shrub, branches very long, glabrous, often with lenticels; l. 3–4½ in., broadly ovate, rounded or sub-cordate at base, suddenly acuminate, acute, glabrous, paler beneath, venation finely reticulate, pellucid, petiole ½–1 in.; fl. numerous, on long slender glabrous ped., cymes umbellate, drooping, peduncle 1½–2 in., stiff, bracts filiform, inconspicuous; cal.-segm. acute, glabrous; cor.-lobes broadly oval, obtuse, veiny; follicles 3–4 in., slightly tapering to very blunt point, cylindrical, shallowly grooved, glabrous, dull yellow.

Low country up to 3000 ft.; rather common. Fl. March, April; apple-green, sweet-scented.

Also in India and Java.

The rather large umbels of bright green flowers are very striking The leaves are eaten in curries: they are also used as a medicine for fevers in children.

17. DISCHIDIA, *Br.*

Epiphytic, herbaceous, creeping not twining, l. fleshy, fl. few, axillary, very small; sep. 5, ovate, membranous; cor. urceolate, contracted at mouth, lobes 5, very short, valvate; column very short, stam. 5, connate, anth. with a membranous tip, pollen-masses 1 in each cell, compressed, pendulous coronal processes adnate to stam., erect, bifid; follicles very small, glabrous; seeds minute, with long coma.—Sp. 24; 11 in *Fl. B. Ind.* (but none in Peninsular India).

D. Nummularia, *Br. Prod. Fl. Nov. Holl.* 461 (1810).

Thw. Enum. 198. C. P. 3875.

Fl. B. Ind. iv. 49 (not given for Ceylon). Rumph. Herb. Amboin. v. t. 176, f. 1.

A small, creeping, epiphytic herb, stems very slender, glabrous, prostrate, rooting at the nodes; l. very small, ¼–⅜ in., very shortly stalked, orbicular, apiculate, glabrous, very fleshy; fl. (not seen) small, pedicellate, 1–3 together in l.-axils; follicles 1–1½ in.

On tree-trunks, very rare, at 2000–3000 ft. Matale Dist., 1865 (Capt. G. L. Williams); Telgama Ganga, Lagalla, 1867 (T. N. Beckett). Fl. white (in our drawing; scarlet according to Fl. B. Ind.).

Also in Cachar, Burma, Malaya, and Trop. Australia.

The leaves dry white, and then show the venation. I have never met

with this, nor seen fresh specimens. There is an old drawing in the Peradeniya collection without locality. Vahl's name, *Collyris*, for this genus has priority over *Dischidia.*

18. **HOYA,*** *Br.*

Twining or climbing shrubs, l. thick and fleshy, fl. rather large, in axillary umbels; cal. divided to base, segm. 5; cor. rotate, fleshy, lobes 5, valvate; column large, conspicuous, stam. 5, connate, anth. membranous, covering over top of stigma, pollen-masses 1 in each cell, erect, shortly pedicelled, coronal processes large, fleshy or horny, adnate to stam., spreading stellately; follicles narrowly linear; seeds small, with long coma.—Sp. 60; 39 in *Fl. B. Ind.*

L. narrowly oblong, obtuse . . . 1. H. PAUCIFLORA.
L. oval, acute . . . . . . 2. H. OVALIFOLIA.

1. **H. pauciflora,** *Wight, Ic.* iv. pt. 1, 16 (1850).
H. Wightiana, Thw. Enum. 199. C. P. 2762.
Fl. B. Ind. iv. 56. Wight, Ic. t. 1269.

A climbing shrub, often epiphytic, stems slender, cylindrical, giving off numerous adventitious roots, glabrous, the younger ones slightly twining; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., oblong-lanceolate or oblong-linear, tapering or rounded at base, broadly obtuse at apex, glabrous, shining, fleshy, often dotted with purple beneath, petiole $\frac{1}{4}$ in.; fl. rather large, on slender glabrous ped., 2–12 in sessile or very shortly stalked umbels, buds depressed, 5-angled; sep. small, lanceolate, glabrous; cor. about $\frac{3}{4}$ in. diam., lobes broad, obtuse, or subacute, minutely papillose and ciliolate, column depressed, coronal processes conspicuous, fleshy, somewhat compressed, concave above; follicles about 4 in., linear, very slender.

Forests of the moist region on tree trunks and rocks in the lower montane zone; rather common. Hantane; Ramboda; Maturata; Kitulgala. Fl. March and Sept.; white, column purple.

Also in Malabar and Travancore.

A beautiful plant; the name *pauciflora* is not always appropriate to the Ceylon form.

2. **H. ovalifolia,** *W. & A. in Wight, Contrib.* 37 (1834).
Thw. Enum. 198. C. P. 2670.
Fl. B. Ind. iv. 60. Wight, Ic. t. 847 (not good).

A twining shrub, stems rather stout, glabrous, thickened at the nodes; l. $1\frac{1}{2}$–3 in., oval, tapering to slightly rounded

---

* In honour of Mr. Thomas Hoy, 'an intelligent and successful cultivator' at Sion House. Died 1809.

base, shortly acuminate, acute, glabrous, very thick, paler beneath, petiole short, stout; fl. numerous, on rather long glabrous ped., in umbels which continue to produce buds on the central axis which becomes thickened and elongated, peduncle stout, stiff, as long as l.; cal.-segm. very small, acute, glabrous; cor. under $\frac{1}{2}$ in. diam., glabrous, lobes broad, subacute; column very large and prominent, coronal processes spreading, ovate, pointed, thick, horny, shortly spurred at base; follicles not seen.

Forests of the moist low country; very rare. Kitulgala and other places in Ambagamuwa District (Thwaites). Fl. March; greenish or purplish-white.

Also in S. India.

I have not seen this living.

19. **HETEROSTEMMA**, *W. & A.*

Perennial twiner, l. thin, fl. rather large, in umbellate axillary cymes; cal. small, segm. 5; cor. rotate, cut about half way down into 5 lobes, valvate; column small, much depressed, stam. 5, connate, anth. small, with a short rounded tip, pollen-masses minute, 1 in each cell, erect, ovoid, compressed, nearly sessile, coronal processes large, fleshy, rounded, spreading horizontally, with a large erect appendage on upper side; follicles divaricate, linear, smooth; seeds comose.—Sp. 10; 5 in *Fl. B. Ind.*

H. tanjorense, *W. & A. in Wight, Contrib.* 42 (1834).
Thw. Enum. 198. C. P. 1856.
Fl. B. Ind. iv. 47. Wight, Ic. t. 348.

Perennial, stems long, twining, glabrous, slender, thickened at the nodes; l. $2\frac{1}{2}$–4 in., oblong-ovate, rounded or subcordate at base, very acute, glabrous, thin, 3- or 5-nerved at base with a prominent gland there on upper surface, paler beneath with prominent venation; fl. on long glabrous ped., cymes sessile or on very short peduncles; cal.-segm. lanceolate, subacute, glabrous; cor.-lobes broad, acute; coronal processes very conspicuous; follicles about 4 in.; seeds $\frac{1}{4}$ in., oblong, narrowly winged, coma 1 in.

Moist region to 4000 ft.; rare. Hantane. Fl. June; dark purplish or greenish-brown.

Also in S. India.

The Fl. B. Ind. distinguishes our plant from the Indian, as var. *zeylanicum*, Hk. f., by its acute leaves.

20. LEPTADENIA, *Br.*

Shrubby twiner, fl. small, in umbellate interpetiolar cymes; cal.-segm. 5, small; cor. rotate, lobes 5, with strongly recurved margins, tufted at apex, valvate, corona double, corolline one 5-lobed; column short, stam. 5, connate, anth. rounded at tip, pollen-masses 1 in each cell, erect, not compressed, staminal corona only represented by an undulate ring below anth.; follicles not seen.—Sp. 12; 2 in *Fl. B. Ind.*

L. reticulata, *W. & A. Contrib.* 47 (1834). **Pálai,** *T.*
Cynanchum ovatum, Thunb. Obs. de Cynanch. 6 (?). *Dæmia reticulata*, Moon Cat. 20. Thw. Enum. 198. C. P. 1846.
Fl. B. Ind. iv. 63. Wight, Ic. t. 350.

Twining shrub, stems long, cylindrical, glabrous or hoary-pubescent, much branched; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., ovate, rounded or subacute at base, shortly acuminate, acute, glabrous above, very finely pubescent beneath, petiole $\frac{1}{4}$–$\frac{3}{4}$ in., finely pubescent; fl. small, numerous, pedicellate, cymes globose, crowded, on short peduncles from between the petioles; cal. pubescent, lobes obtuse; cor. about $\frac{1}{4}$ in. diam., thick, pubescent on both sides, lobes acute, erect; follicles "$2\frac{1}{2}$–3 in., straight, turgid, almost woody, smooth."

Dry country; rather common. Trincomalie (Moon); Puttalam; Mannar; Anuradhapura. Fl. August; greenish-yellow.
Also in India, Burma, and Singapore.

21. CEROPEGIA, *L.*

Twining perennial glabrous herbs, l. glabrous, thin, fl. few, in umbellate, axillary, peduncled cymes; sep. 5, subulate or filiform, glabrous; cor. tubular, often curved, base more or less inflated, upper part usually funnel-shaped, lobes 5, valvate and reduplicate in bud, permanently connate by their tips and forming an open-sided dome; column small, short, stam. 5, connate, pollen-masses 1 in each cell, erect, corona (staminal) cupular, with 10 (or 5) erect linear lobes externally and 5 erect processes internally usually adnate to anth., follicles long, slender, glabrous; seeds comose.—Sp. 50; 36 in *Fl. B. Ind.*

Cor.-tube funnel-shaped above.
  Dome of cor.-lobes hemispherical or depressed.
    Dome hemispherical . . . . . . 1. C. ELEGANS.
    Dome mnch depressed . . . . . 2. C. GARDNERI.
  Dome of cor.-lobes semi-ovoid or oblong.
    Cor.-lobes oblong-ovate, much shorter than tube . . . . 3. C. THWAITESII.
    Cor.-lobes linear, nearly as long as tube. . 4. C. DECAISNEANA.
Cor.-tube cylindrical above.
    Fl. $1\frac{1}{2}$–2 in., lobes about $\frac{1}{2}$ as long as tube . 5. C. BIFLORA.
    Fl. $\frac{3}{4}$ in., lobes about $\frac{1}{4}$ length of tube . . 6. C. PARVIFLORA.

The cor.-tube (in *C. elegans*) has a ring of stiff hairs within just above its swollen base pointing downwards, and completely closing the passage: small Diptera are caught in this trap.

1. **C. elegans,** *Wall. in Bot. Mag.* t. 3015 (1830).
Thw. Enum. 199 (in part). C. P. 738.
Fl. B. Ind. iv. 68. Wight, Ic. t. 1265.

Stems slender, elongated, l. $1–2\frac{1}{2}$ in., narrowly lanceolate or ovate-lanceolate, acute at base, much tapering to acute apex, petiole $\frac{1}{2}$ in.; fl. somewhat large, on rather long ped., 1–4 (often solitary); cor. $1\frac{1}{2}–1\frac{3}{4}$ in., curved, inflated base nearly globose, upper part broadly funnel-shaped, lobes oblong-oval, obtuse, usually ciliate with few long bristles, dome hemispherical or nearly so; coronal lobes 10; linear, straight, a little shorter than the adnate processes; follicles 6–8 in., linear, very slender, membranous.

Var. β, **Walkeræ.** *C. Walkeræ*, Wight, Ic. Pl. 4, 1, 16, and t. 1266. Fl. B. Ind. iv. 69.

L. broader, often rounded at the base; cor. larger, the lobes usually without cilia.

Moist and intermediate regions; rather common up to 4000 ft. Hantane; Kandy; Matale; Balangoda; Nitre Cave. Var. β, Kandy; Ekiriankumbura. Fl. Sept.–Feb.; greenish, more or less spotted and stained with purple.

Also in S. India.

The presence or absence of cilia are very inconstant characters, and the colour of the flowers and form of the leaves vary greatly. I find myself quite unable to separate *C. Walkeræ* as a species (as is done in Fl. B. Ind.), and follow Thwaites in combining it with *C. elegans*. It was first collected by Wight near Kandy, and his plate was drawn by Mrs. Walker. It shows the cor.-lobes *with* cilia.

2. **C. Gardneri,** *Thw. Enum.* 199 (1860).
C. P. 2838.
Fl. B. Ind. iv. 69. Bot. Mag. t. 5306.

Stems rather stout, l. $1\frac{1}{2}–3$ in., oblong-lanceolate, rounded at base, tapering to acute apex, petiole $\frac{1}{2}–\frac{3}{4}$ in.; fl. large, on rather nodding ped., 1–4 in umbel; cor. $1\frac{1}{2}–2$ in., much curved,

inflated base oblong-ovoid, upper part very broadly funnel-shaped, lobes very broad, dilated and cucullate forming pouches, ciliate with numerous short bristles, dome much depressed (not hemispherical) often nearly flat, coronal lobes 10, linear, distinctly shorter than the linear-lanceolate adnate processes; follicles not seen.

Montane zone; very rare. First collected by Gardner. Ramboda, 4000–5000 ft.; Pundaloya (E. Green); Peradeniya, doubtfully wild. Fl. Oct.; whitish or cream-coloured, mottled or spotted with purple.

Endemic.

Closely allied to *C. elegans*, but distinguishable by the form of the corolla, especially before expansion. The buds are strongly 5-angled or star-shaped, and the dome of united petals nearly flat. This plant is in cultivation in hot-houses at home.

3. **C. Thwaitesii,** *Hook. in Bot. Mag.* t. 4758 (1854).
Thw. Enum. 199. C. P. 1842.
Fl. B. Ind. iv. 71. Bot. Mag. t. 4758.

L. 1½–3½ in., ovate or lanceolate-ovate, rounded or cordate at base, acuminate, acute, paler beneath with conspicuous veins, petiole ½–¾ in.; fl. 1–5, subumbellate, on slender glabrous ped., peduncle short, ¼–¾ in.; cor. 1½–2 in. curved, inflated base globose, suddenly narrowed above, upper part funnel-shaped, lobes long, oblong-ovate, obtuse, glabrous, very blunt; coronal lobes 10, in pairs, ciliate, much shorter than the connivent glabrous processes; follicles not seen.

Moist low country above 1000 ft.; rare. About Peradeniya; near Matale in several places. Fl. December; green, tube spotted and stained with purple, and with a broad purple band across the lobes.

Also in Travancore.

4. **C. Decaisneana,** *Wight, Ic.* iv. pt. 1, 14 (1850).
Trim. in Journ. Bot. xxvii. 164.
Fl. B. Ind. iv. 73 (not given for Ceylon). Wight, Ic. t. 1259.

L. 3½–4½ in., oval-ovate, rounded or subacute at base, acute at apex, petiole ¾–1 in.; fl. large, 5–8, subumbellate, on long glabrous ped., bracts very small, peduncle 1¼–1½ in.; cor. 2½–3 in., curved, inflated base large, oblong-ovoid, suddenly contracted above, upper part widely funnel-shaped, lobes nearly as long as tube, linear, from a wide base, obtuse, strongly ciliate, dome narrowly oblong, blunt; coronal lobes 5, bifid, hairy, half the length of the stiff erect connivent processes; follicles not seen.

Montane zone; very rare. Only found in one spot in the Rangala District at about 4000 ft. Fl. Sept.; green, lobes purple at ends.

Also in the Nilgiri Mountains.

Our largest-flowered species.

5. **C. biflora,** *L. Sp. Pl.* 211 (1753). **Wel-mottu,** *S.*
Fl. Zeyl. n. 110. *C. Candelabrum,* Moon Cat. 21 (non L.). Thw. Enum. 199 (non L.). C. P. 774.
Fl. B. Ind. iv. 70 (*C. intermedia*). Wight, Ic. t. 1263 (*C. intermedia*).

Stems very long, l. 1½–4 in., lanceolate, ovate-lanceolate, or oval, acute or rounded at base, acute, apiculate, petiole ¼–½ in., fl. large, on slender glabrous ped., 1–8, umbel often shortly racemose, bracts small, linear, peduncles 1½–3 in., stiff; cor. 1½–2 in., straight, inflated base ovoid, tapering above, upper part cylindrical, not funnel-shaped, lobes narrowly lanceolate, pubescent within, usually prolonged into linear or sub-spathulate tails, dome ovoid or oblong; coronal lobes 5, very short and inconspicuous, adnate processes much exceeding the column, fleshy, blunt; follicles 3–6 in., linear, very slender, membranous; seeds slightly beaked, compressed.

Dry country; common, extending more rarely into the intermediate or moist regions, as at Hanguranketa and Ambagamuwa. Fl. Nov.–Feb.; whitish, striped with purple, lobes greenish-yellow and purple.

Also in S. India.

There is no specimen in Hermann's Herb., but his drawing shows that this is the species intended by Linnæus. The name *biflora* is not, indeed, very apt, but there are usually not more than two flowers expanded at once in the umbels. The flowers are very variable in colour and size. *C. Candelabrum,* L., is wholly based on the figure in Rheede, Hort. Mal. ix. t. 16, and the plant is not otherwise known.

6. **C. parviflora,** *Trim. in Journ. Bot.* xxvii. 164 (1889). [PLATE LXIII.]

Roots fasciculate, stems very long, slender; l. 1½–3 in., ovate, rounded, the lower ones subcordate at base, tapering to very acute apex, petiole ¾–1½ in., fl. small, on slender ped., 2–5, subumbellate, peduncles slender, about 1 in., cor. about ¾ in., slightly curved, inflated base oblong-ovoid, upper part cylindrical (not funnel-shaped), lobes very short, oblong-lanceolate, not produced into tails, dome semi-ovoid, blunt; coronal lobes 10, acute, ciliate at base, and with a line of cilia between them, a little shorter than the spathulate glabrous processes; follicles 5–6 in., very slender, slightly torulose.

Dry country; very rare (?). In several places near Anuradhapura. Fl. Feb.; pale greenish-yellow.

Endemic.

Easily known by its very small pale yellow flowers.

22. CARALLUMA, *Br.*

Perennial herbs, with fleshy, succulent, erect stems, l. minute, deciduous; fl. solitary and axillary or in terminal umbels;

sep. 5, narrow, glabrous; cor. rotate, or very shallowly campanulate, lobes 5, narrow or broad, valvate; column very small, stam. 5, adnate, short, pollen-masses 1 in each cell, nearly sessile, globose, corona (staminal) annular, with 10 narrow lobes in pairs, and 5 broader and longer processes curving over top of anth.; follicles long, linear; seeds flattened, winged, comose.—Sp. 38; 10 in *Fl. B. Ind.*

Boucerosia cannot be kept up as a genus distinct from *Caralluma*, though the inflorescence in our species differs characteristically.

Fl. solitary, axillary . . . . . . 1. C. FIMBRIATA.
Fl. umbellate, terminal . . . . . 2. C. CAMPANULATA.

1. **C. fimbriata,** *Wall. Pl. As. Rar.* i. 7 (1830). **Mankalli,** *T.*
Stapelia adscendens. Moon Cat. Add. (non Roxb.). *C. attenuata*, Thw. Enum. 200; Trim. Syst. Cat. 56 (non Wight). C. P. 3304.
Fl. B. Ind. iv. 76 (*C. attenuata*). Wall. l. c. t. 8.

Stems 3–9 in., decumbent at base, with many fibrous roots, then erect, ¼ in. diam., bluntly quadrangular, smooth, succulent, often slightly arched at summit; l. minute on prominences of the angles, lanceolate, apiculate, fleshy, soon falling; fl. small, on short stout ped., solitary, axillary, nodding; cal.-segm. lanceolate, acute, glabrous; cor. about ½ in. diam., lobes deep, lanceolate, very acute, reduplicate, upper half very strongly ciliate, with long, stiff, bristly, deciduous, purple hairs; column depressed; coronal lobes in divaricate pairs, filiform, processes oblong, closely incurved over anth.; follicles 4–4½ in., erect, linear, cylindrical, tapering, glabrous.

Dry region, in arid stony places; rare. Uma-oya (Thwaites); Mannar District (Crawford); Panuwa Pattu, E. Prov. (Nevill). Moon's locality is Tumpane. Fl. Feb., April, May, November; dark reddish-purple, greenish-yellow in the tube.
Also in S. India and Burma.
The Ceylon plant agrees well with Wallich's plate, and not at all with that of Wight's *attenuata* (Ic. t. 1268). The flowers are, however, a little smaller. Said to be eaten by deer in the dry season in the Mannar District, hence the Tamil name.

2. **C. campanulata,** *N. E. Br. in Gard. Chron.* 1892, ii. 369 (1892).
Stapelia umbellata, Moon Cat. Add. (non Roxb.). *Boucerosia umbellata*, Thw. Enum. 200; Trim. Syst. Cat. 56 (non W. & A.). C. P. 2861.
Fl. B. Ind. iv. 77 (*B. umbellata*). Wight, Ic. t. 1287 (*B. campanulata*). Bot. Mag. t. 7274.

Stems 6–12 in., ascending or erect, much branched, nearly ½ in. diam., succulent, smooth, sharply quadrangular, the edges undulate-serrate; l. minute at the serratures, oval, slightly ciliate, succulent, soon falling; fl. large, 6–12, in a sessile

terminal umbel, ped. ¾ in., glabrous, bracts small, linear; cal.-segm. linear, acuminate, slightly ciliate, cor. rather over 1 in. diam., rotate, flat, star-like, lobes shallow, broadly triangular, with a short acuminate tip, surface densely velvety; column depressed, coronal lobes falcate, acute, processes longer, oblong, closely folded over anth.; follicles 4–4½ in., somewhat divaricate, linear, glabrous; seeds ⅜ in., oval, coma over 1 in.

Intermediate region on rocks; very rare. Hewahette (Moon); Kurunegala. Fl. Jan., June; deep red-purple.

Endemic (?).

The fl.-bud is 5-angled and quite flat, the cor.-lobes being folded down from the base so that the points meet in the centre. Thwaites considered *B. campanulata* and *B. umbellata* as mere synonyms, but the latter is a stouter plant and has the corolla marked with transverse yellow lines.

LXXXVI.—LOGANIACEÆ.

TREES or shrubs, rarely herbs, l. opp. (or in threes) entire, with or without stip., fl. regular, bisexual, usually in cymes; cal. free, segm. 4 or 5; cor.-lobes 4 or 5, valvate or imbricate; stam. 4 or 5, inserted in cor.-tube; ov. superior (or half-inferior in *Gaertnera*) 1 or 2-celled, with 1 or many ovules in each cell, styles 1 or 2; fruit usually fleshy, indehiscent, rarely a capsule; seeds 1, 2, or many, embryo straight, in copious endosperm.

Annual herb; fruit a capsule . . . . . 1. MITRASACME.
Trees or shrubs; fruit a berry.
  Ovules numerous in each ov.-cell.
    Lobes of cor. contorted . . . . . 2. FAGRÆA.
    Lobes of cor. valvate . . . . . 3. STRYCHNOS.
  Ovule solitary in each ov.-cell . . . . 4. GAERTNERA.

This family differs from *Rubiaceæ* in little but its superior ovary, and even this character is not absolute. Our four genera are more or less parallel to the following Rubiaceous ones:—1. To *Oldenlandia*, 2. to *Gardenia* or *Randia*, 3. to *Carissa*, not closely, and 4. to *Psychotria* or *Saprosma*.

We have fourteen species. All those of *Strychnos* occur in the low country, four being restricted to the dry region and two to the moist, one of the latter extending also into the hill-country. The four species of *Gaertnera* are all confined to the moist region, two in the low country and two montane; one species of *Fagræa* also extends into the montane zone; *Mitrasacme* is a low-country plant. Of our species five, or perhaps six, are endemic.

1. MITRASACME, *Lab.*

Annual herb, l. opp., connate at base, fl. axillary, solitary; cal. campanulate, segm. 4; cor. campanulate, lobes 4, valvate; stam. 4, inserted near base of cor.-tube; ov. 2-celled, with numerous ovules in each cell, stigma 2-lobed, the styles ultimately distinct; fruit a capsule, capped by 2 horns (persistent distinct styles), 2-celled, dehiscent from above down each side of septum; seeds numerous, ovoid, peltately attached, minutely lobulate.—Sp. 28; 3 in *Fl. B. Ind.*

M. alsinoides, *Br. Prod.* 452 (1810).
M. indica, Wight, Thw. Enum. 200. C. P. 1677.
Fl. B. Ind. iv. 80. Wight, Ic. t. 1601, left-hand fig. (*M. indica*).

Small, 2–9 in. high, stems slender, compressed, 2-edged, weak, glabrous, slightly branched; l. sessile, linear, acute; fl. on slender spreading ped., much exceeding the l., cal. membranaceous, glabrous, segm. shallow, triangular, acute; cor.-lobes ovate, shorter than tube, slightly hairy at base; capsule globose, surrounded by persistent cal., truncate, but with 2 terminal falcately curved converging horns.

Low country, rather common, but easily overlooked. Fl. Jan.–April; white.

Also in India, Burma, Borneo, Philippines, Australia.

Easily mistaken at first sight for an *Oldenlandia*.

Buddleia asiatica, Lour., a common Indian and Malayan species, has not been met with in Ceylon.

2. FAGRÆA, *Thunb.*

Shrubs or small trees, l. opp., without stip., thick, fl. very large, in terminal trichotomous cymes; cal. deeply cut into 5 rounded, imbricate segm., persistent and enlarged in fruit; cor. tubular-funnel-shaped, lobes 5, much contorted; stam. 5, inserted in cor.-tube, anth. versatile; ov. 1-celled or 2-celled by coalescence of placentas, with very numerous ovules, style long, simple, stigma large, capitate; fruit fleshy, indehiscent; seeds very numerous, immersed in the pulpy placentas, embryo small, in horny endosperm.—Sp. 30; 12 in *Fl. B. Ind.*

Cor.-tube over 3 in., lobes less than half as long . 1. F. ZEYLANICA.
Cor.-tube under 2 in., lobes more than half as long . 2. F. OBOVATA.

1. **F. zeylanica,** *Thunb. Gen. Nov.* 35 (1782). **Etamburu,** *S.*
Solandra oppositifolia, Moon Cat. 15. Thw. Enum. 200. C. P. 1824.
Fl. B. Ind. iv. 83. Bl. Rumph. ii. t. 78, f. 2. Bot. Mag. t. 6080 (from a Ceylon specimen).

A small tree, bark rough, worted and vertically cracked, greyish-brown, l. large, very nearly sessile, 5–10 in., oval-obovate, much tapering to base, rounded at apex, glabrous, entire, undulate, rather thick, dark green and shining above, paler beneath, lat. veins very few, prominent beneath, petiole very short, thick, dilated and stem-clasping at base; fl. very large, on thick short ped., cymes glabrous; cal. thick and fleshy, glabrous, segm. broadly oblong-oval, very obtuse, with membranous margins; cor. rather fleshy, tube $3\frac{1}{2}$–$4\frac{1}{2}$ in., slightly funnel-shaped, glabrous, lobes less than half as long as tube, oval, obtuse, recurved; stam. inserted about $\frac{1}{3}$ down tube, slightly exserted, ov. oblong, style slightly exceeding stam.; fruit $1\frac{1}{2}$–2 in., broadly ovoid, bluntly apiculate, smooth and shining, pale glaucous greenish-white, pericarp thick; seeds very numerous, ovoid, finely worted, dark brown.

Low country up to 2000 ft., principally in the moist region, rather common. Fl. May–June; cream-coloured, the tube pale greenish-yellow.

Also in S. India.

A beautiful plant both in flower and foliage. Collected by Kœnig (*Gardenia heteroclita*) here first.

2. **F. obovata,** *Wall. in Roxb. Fl. B. Ind. ed. Carey & Wall.* ii. 33 (1824).

Thw. Enum. 200. C. P. 757.

Fl. B. Ind. iv. 83. Wight, Ic. t. 1316 (*F. coromandeliana*) and t. 1317 (*F. malabarica*).

A shrub, often semi-scandent, branches more slender than in *F. zeylanica*, bark pale yellowish-grey, with very conspicuous leaf-scars; l. as in the last, but usually rather shorter; fl. smaller; cor.-tube $1\frac{1}{4}$–$1\frac{1}{2}$ in., distinctly funnel-shaped, lobes broadly oval, more than half as long as tube; stam. inserted about half way down cor.-tube; fruit $1\frac{1}{4}$–$1\frac{3}{4}$ in., oblong-ovoid, acute.

Var. β, **Gardneri,** *Clarke in Fl. B. Ind. l. c.* *F. Gardneri,* Thw. l. c. C. P. 1826.

More scandent, l. larger, obtuse or slightly subcordate at base; fl. rather larger; ov. usually 2-celled.

Lower montane zone and down to 2000 ft., rather common. Var. β, Hantane. Fl. May and June, October; yellowish-cream-coloured, sweet-scented.

Also in India, Burma, and Malaya.

Usually semi-parasitic on large trees when young, but afterwards independent or semi-scandent. The leaves sometimes attain 16 or 18 in. in length.

3. **STRYCHNOS,*** *L.*

Trees or shrubs, often more or less scandent by woody hooked tendrils, which are axillary but take the place of suppressed l.; l. opp., without stip., usually 3- or 5-nerved; fl. rather small, in terminal or axillary cymes; cal. small, 4- or 5-toothed; cor.-lobes 4 or 5, valvate; stam. 5, inserted in cor.-tube, fil. very short; ov. 2-celled, with several ovules in each cell; fruit a globose berry, with thin pericarp and several (rarely 1) seeds immersed in pulp; seeds large, more or less compressed, embryo small, in copious horny endosperm.—Sp. 60; 19 in *Fl. B. Ind.*

Shrubs, more or less scandent by woody hooked tendrils.	
Cor.-tube not longer than lobes.	
Cor.-lobes 5.	
Fruit ½ in. diam.	1. S. MICRANTHA.
Fruit over ¾ in. diam.	
Cor.-tube shorter than lobes . .	2. S. COLUBRINA.
Cor.-tube as long as lobes . . .	3. S. BEDDOMEI.
Cor.-lobes 4; fruit ⅓-in. diam. . . .	4. S. BENTHAMI.
Cor.-tube more than twice as long as lobes .	5. S. CINNAMOMIFOLIA.
Erect trees.	
Cor.-tube more than twice as long as lobes; cymes terminal	6. S. NUX-VOMICA.
Cor.-tube a little longer than lobes; cymes axillary	7. S. POTATORUM.

1. **S. micrantha,** *Thw. Enum.* 425 (1864) (in part). **Kachchal-kodi,** *T.*
C. P. 3720, 1866 (fruit).
Fl. B. Ind. iv. 86.

A climbing shrub, branches rough, slightly thickened at nodes, tendrils few, falcate, often in terminal pairs; l. 2½–4½ in., oval or ovate-lanceolate, tapering at base into short petiole, acuminate, acute, 3- or sub-5-nerved, firm; fl. very small, numerous, cymes short, axillary, puberulous; cal.-segm. rounded, obtuse, ciliolate; cor. villous in throat, lobes 5, longer than tube; berry small, barely ½ in. diam., apiculate; seeds 1 or 2, circular, ⅓ in., lenticular.

Low country, rare. Near Peradeniya; near Galle; Trincomalie (Nevill). Fl. March; white.
Endemic.

---

* Linnæus took up the Greek *στρύκνον* for this genus, but that name really applied to some other poisonous plant.

2. **S. colubrina,*** *L. Sp. Pl.* 189 (1753), var. **zeylanica,** *Clarke in Fl. B. Ind.* iv. 87.

S. minor, Bl. Rumph. i. 70. *S. minor*, var. *α*, *nitida*, Benth. in Journ. Linn. Soc. i. 101. Moon Cat. 16. Thw. Enum. 201. C. P. 2516.

Fl. B. Ind. iv. 87. Rheede, Hort. Malab. vii. t. 5.

A large woody climber, bark smooth, with numerous lenticels, grey, young shoots puberulous, tendrils usually solitary, strongly circinate; l. 2–3½ in., oval or rhomboid-oval, much tapering to both ends, acute, quite glabrous, 5-nerved, coriaceous, paler beneath, petiole short; fl. small, numerous, cymes nearly sessile, short, puberulous; cal.-segm. rounded, pubescent, ciliate; cor.-lobes 5, as long as tube, oblong, subacute; ov. glabrous, not tapering into style; berry ¾–1 in., crustaceous; seeds 2–4, ovoid, ⅝ in., very slightly compressed, glabrous, brown.

Dry and intermediate regions, rather common. Haragama; Galagama; Doluwa Kande; Dambulla; Anuradhapura; Nilgala; Maturata. Fl. Feb.–April; white.

Also in S. India.

The strong circinately curved tendrils are usually very well marked in this species, but are not shown in Rheede's figure. The Ceylon variety differs from the type in having the leaves narrower and more rhomboid and 5- (instead of 3-) nerved. Blume's authority for Ceylon is Van Royen. I have no evidence of the wood of this being collected for use in Ceylon as a snake-medicine at the present time. Much confusion has been caused by authors quoting for this species Rheede, Hort. Mal. viii. t. 24, which has a very much larger fruit, and does not seem to be known to modern botanists (=*S. Rheedei*, Clarke), but may probably be *S. cinnamomifolia*, Thw. (q. v.).

3. **S. Beddomei,** *Clarke, Fl. B. Ind.* iv. 88 (1883).

S. micrantha, Thw. Enum. 425 (in part) and 201 (*S. laurina*). C. P. 3540.

Fl. B. Ind. iv. 88.

Scandent (or an erect tree), bark smooth, with lenticels, tendrils few, small, falcate, in terminal pairs; l. large, 3–5 in., oval or lanceolate, rounded or narrowed at base, much acuminate, apiculate, 3-nerved, coriaceous, shining above, pale beneath, transverse venation prominent; cymes rather lax, nearly sessile, axillary, pubescent; cal. very small, segm. short, rounded, puberulous; cor. ¼ in. diam., lobes 5, as long as tube, acute; ov. glabrous or nearly so, tapering into style; berry over ¾ in. diam.

Var. *β*, **coriacea,** *Clarke, l. c.* *S. coriacea*, Thw. Enum. 425. C. P. 3367.

---

* The wood is the true *Lignum colubrinum* of the old pharmacists, and is the second kind from Ceylon described by Garcia de Orta (see under *Rauvolfia serpentina*).

L. rather smaller, less acuminate, very coriaceous; cor. larger; ov. villous.

Low country, rare. Galle (Champion); Bibile. Var. β, 'Central Province.' Fl. Feb.; white.

Also in Travancore.

This is very like *S. colubrina*, but apparently sometimes an erect tree. Var. β may be a distinct species, as considered by Thw., but there is no fruit to the C. P. specimens. Thwaites confused this with and included it in his *S. micrantha*, and Clarke's (in Fl. B. Ind.) description seems still partly to be taken from that species.

4. **S. Benthami,** *Clarke in Fl. B. Ind.* iv. 87 (1883).

S. minor, Benth. in Journ. Linn. Soc. i. 101 (excl. var. *a*) (non Bl.); Thw. Enum. 201. C. P. 187.

Fl. B. Ind. iv. 87.

A small shrub, scarcely at all scandent, with very many divaricate branches, the younger ones often with long, straight, sharp, slender spines in the axils, tendrils small, terminal, solitary, circinate; l. 1½–3 in., ovate-oval, acute at both ends, apiculate, 3- (or faintly 5-) nerved, paler beneath, petiole short; fl. few, very small, cymes small, nearly sessile, axillary, pubescent; cal.-segm. short, acute, puberulous; cor.-lobes 4 (rarely 5), hairy within, acute; berry small, about ⅓ in. diam., seeds usually 2, plano-convex.

Var. β, **parvifolia,** *Benth. l. c.* C. P. 341.

Intricately and very divaricately branched, with many horizontal twigs, spines, and tendrils; l. smaller, ½–1 in.

Moist low country, rather rare. Colombo; Kalutara; Balangoda. Var. β, montane zone, common. Fl. June–September; white.

Endemic.

This is perhaps the *S. recurva*, Moon Cat. 15, for which he gives the native name 'Katukirindi.' It has much the habit and appearance of a *Canthium*, or (var. β) of a small *Eugenia*. A form of var. β, with the leaves much acuminate, occurs at Matale East and Nitre Cave (var. *angustior*, Benth. l. c.).

5. **S. cinnamomifolia,** *Thw. Enum.* 201 (1860). **Eta-kirindi-wel, Wel-beli,** *S.*

S. inermis, Moon Cat. 15 (?). Thw. Enum. 201. C. P. 1867.

Fl. B. Ind. iv. 89. Wight, Ic. t. 434 (?) (*S. colubrina*).

A very large woody climber, stems attaining 3–4 in. diam., bark smooth, yellowish-grey, branches divaricate, twigs dilated at nodes, tendrils large, solitary, axillary and terminal, circinate, much thickened; l. 3–4 in., oval or lanceolate-oval, tapering or rounded at base, acuminate, acute, strongly 3-nerved, petiole ¼–⅜ in.; fl. large (for genus), on pubescent ped.,

cymes terminating branchlets, pedunculate, shorter than l.; cal. pubescent, segm. ovate, acute; cor. pubescent outside, tube nearly ½ in., lobes 5, less than half as long as tube, lanceolate, acute; berry 1½–3 in. diam., pericarp thin, seeds several, immersed in pulp, similar to those of *S. Nux-vomica* in all respects, but rather less compressed.

Moist low country to 3000 ft., rather rare. Galle; Peradeniya; Hantane; Heneratgoda. Fl. white.

Endemic (Silhet, Roxburgh?).

Wight's plate, if it represent this species, is incorrect as to the venation of the leaves. It is not unlikely that Reede's figure referred to under *S. colubrina* (Hort. Mal. viii. t. 24) really represents this; but it is not known from S. India.

6. **S. Nux-vomica,** *L. Sp. Pl.* 189 (1753). **Goda-kaduru,** *S.* **Eddi, Kanchurai,** *T.*

Herm. Mus. 41. Burm. Thes. 171. Moon Cat. 15. Thw. Enum. 201. C. P. 2839.

Fl. B. Ind. iv. 90. Bedd. Fl. Sylv. t. 243. Bentl. & Trim. Med. Pl. t. 178.

A rather small or moderate-sized tree, trunk erect, bark smooth, yellowish-grey, twigs numerous, opposite, cylindrical, compressed and dilated at nodes, glabrous; l. 2½–4 in., broadly oval, often rather unequal-sided, acute or rounded at base, very shortly acuminate, obtuse, 5-nerved (lateral pair often faint), glabrous and shining, thin, venation copious, finely reticulate, petiole ¼–½ in.; fl. on slender ped., numerous, cymes terminal, peduncled, paniculate, pubescent; cal. pubescent, segm. lanceolate, acute; cor. glabrous or nearly so outside, tube ⅓ in. or a little more, hairy within, lobes 5, less than half as long as tube, ovate, acute; ov. and style glabrous; berry variable in size, 1–1¾ in. diam., slightly rough but shining, dead orange-red when ripe, pericarp thin, brittle; seeds 1–6, immersed in pinkish-grey pulp, button-shaped, circular, about ¾ in. diam., much compressed, flat, slightly concave above and convex beneath, silvery-grey and shining with a dense covering of very fine adpressed hair radiating from centre, embryo with cordate cotyledons and a long radicle.

Forests of the dry region, common. Fl. August; greenish-white.

Also in Peninsular India and Burma, and probably further East.

The seeds, the principal source of the poisonous alkaloids strychnine and brucine, are an article of export in recent years. The pulp in which the seeds are immersed is undoubtedly eaten by birds, and I am told also by children without ill effects, though it has been shown to contain minute quantities of strychnine. The bark is much used as a tonic, and externally as a remedy for skin-diseases. The smaller fruits have usually but a single seed.

7. **S. potatorum,*** *L. f. Suppl. Pl.* 148 (1781). **Ingini,** *S.* **Téttá,** *T.*

Moon Cat. 16. Thw. Enum. 201. C. P. 3719.
Fl. B. Ind. iv. 90. Wight, Ill. t. 156.

A small tree, bark blackish-grey, corky, deeply furrowed; twigs smooth, much thickened at nodes, young parts glabrous; l. 3–5 in., very nearly sessile, ovate or ovate-lanceolate, acute or rounded at base, tapering to subacute apex, glabrous and shining, spuriously 3- or 5-nerved (the lat. veins coming from lower part of midrib, not from base); fl. rather large (for genus), on slender glabrous ped., cymes small, shortly stalked, axillary, glabrous; cal. glabrous; cor.-tube $\frac{1}{8}$–$\frac{1}{6}$ in., broad, lobes 5, nearly as long as tube, oblong-lanceolate, acute, with a villous tuft within; berry $\frac{1}{2}$–$\frac{3}{4}$ in. diam., nearly black; seeds 1 or 2, immersed in pulp, nearly $\frac{1}{2}$ in., circular, bluntly lenticular, not greatly compressed, pale yellow, shining with short silvery adpressed hair.

Dry country, rather rare (?). Dambulla; Uma-oya; Kurunegala; Trincomalie; Bibile. Fl. November; white.

Also in Southern India and Burma.

The seeds are not poisonous; they are used in medicine, but principally for rubbing on the inside of vessels which are then filled with muddy water, when the impurities are immediately precipitated.

4. **GAERTNERA,**† *Lam.*

Shrubs, l. opp. (or in whorls of 3), with connate stip., cymes terminal; cal. small, cup-shaped or campanulate; cor.-tube slightly funnel-shaped, lobes 5 or 4, valvate, thick; stam. inserted in cor.-tube and included; ov. (often half-inferior) with a fleshy disk on summit, 2-celled, with 1 erect ovule in each cell, styles 2; fruit a berry, subglobose or didymous, 1- or 2-seeded; seed with small embryo in horny endosperm.—Sp. 25; 7 in *Fl. B. Ind.*

L. opposite, in pairs.
  Cymes many-flowered . . . . . 1. G. KŒNIGII.
  Cymes 3- or 5-flowered.
    Cor. pink, lobes 4 . . . . . 2. G. ROSEA.
    Cor. white, lobes 5 . . . . . 3. G. WALKERI.
L. in whorls of 3; fl. solitary . . . . 4. G. TERNIFOLIA.

---

* From the use of the seed in clarifying muddy water, whence also the English name of Clearing-nut.

† In memory of Joseph Gaertner, M.D., F.R.S., a profound and laborious botanist. Died 1791.

1. **G. Kœnigii,*** *Wight*, *Ic.* iv. pt. 2, 6 (1850). **Péra-tambala,** *S.*

Psychotria vaginans, DC. Prod. iv. 520; W. & A. Prod. 434. *Sykesia*† *Kœnigii*, Arn. Pug. 35. Benth. in Journ. Linn. Soc. i. 112. Thw. Enum. 202. C. P. 544.

Fl. B. Ind. iv. 91. Wight, Ic. t. 1318.

A large shrub, branches stout, compressed, glabrous; l. large, 4–7 in., oblong-lanceolate, tapering to base, somewhat acuminate, acute, glabrous, paler beneath, lat. veins arched, conspicuous, petiole about ½ in., stout, stipular sheath ¾–1 in., loose, glabrous, bifid, with acute points; fl. on short pubescent ped., cymes rather large, lax, pyramidal, bracts leafy, acuminate, glabrous, buds very blunt; cal. cup-shaped, nearly truncate, with 5 teeth, glabrous; cor. hairy in throat, lobes 5, as long as tube, oblong, acute; stigmas linear, divaricate, hairy; berry about ¼ in. wide, somewhat didymous (but 1 carp. often undeveloped), smooth, supported on rather enlarged persistent cal.

Var. β, **thyrsiflora,** *Thw. l. c.* *Sykesia thyrsiflora*, Arn. Pug. 35. *G. thyrsiflora*, Bl., Benth. l. c. (part). C. P. 3342.

L. smaller, narrowly lanceolate, more acuminate, cymes narrower, more lax; fl. smaller.

Var. γ, **divaricata,** *Clarke*, *l. c.* *G. divaricata*, Thw. Enum. 450 (*Pristidia divaricata*, Thw. Enum. 149). C. P. 2991.

Branches of cyme long, divaricate, fl. quite sessile, secund; cor.-lobes 4; berry ½ in., blue.

Moist low country to 3000 ft., common. Var. γ, rare. Mapalagama, near Galle. Fl. Sept.–Dec.; white.

Also in Malaya, but not in Peninsular India.

This seems to have been collected by Rottler, whose specimens (Herb. Klein, fide W. & A. l. c.) are labelled 'Bentodi, March 16, 1796.' Kœnig had, however, previously collected it and called it *Ophioxylon arboreum* (DC. Prod. l. c.). Extremely like a species of *Psychotria*, and till in fruit scarcely distinguishable. Indeed, in a young state (as noted by Thwaites in var. γ) the ovary is completely inferior.

I have seen only the C. P. specimens of var. γ, and more material might show it to be a distinct species.

2. **G. rosea,** *Thw. ex Benth. in Journ. Linn. Soc.* i. 111 (1857). Thw. Enum. 201. C. P. 2673.

Fl. B. Ind. iv. 92.

---

* Commemorates J. G. Kœnig, originally Physician to the Danish Mission at Tranquebar, afterwards Botanist 'for the Carnatic' to the Gov. of India, and the Father of modern Indian Botany. Died 1785, and bequeathed his collections and MSS. to Sir J. Banks (now in British Museum). He travelled down the W. coast of Ceylon, Jan.–May, 1781.

† Dedicated to Col. W. H. Sykes, F.R.S., who collected largely about Bombay. Died 1872.

A shrub 8–10 ft., branchlets slender, cylindrical, with 2 prominent ridges, glabrous; l. 1½–2½ in., ovate-lanceolate, tapering to base, very acuminate, acute, petiole very short, stipular sheath short, keeled on back, produced into long filiform, deeply bifid points; fl. nearly sessile, 3 in cyme; cal. shortly tubular, truncate, 4–6-toothed; cor. fleshy, slightly hairy in throat, lobes 4, nearly as long as tube, linear-oblong, recurved; anth. nearly sessile; berry globose, nearly ½ in., purple, seed solitary.

Forests in moist low country, rare. Near Ratnapura; Ambagamuwa; Hewesse, Pasdun Korale. Fl. Dec.–March; rose-pink.
Endemic.

3. **G. Walkeri,** *Wight, Ill.* ii. 172 (1850).
Sykesia Walkeri, Arn. Pug. 36. Thw. Enum. 202. C. P. 288.
Fl. B. Ind. iv. 92. Wight, Ill. t. 156 b, f. 2 (details only).

A shrub, 8–10 ft., twigs slender, cylindrical, thickened at joints, glabrous; l. 2–3½ in., varying from oval to linear-lanceolate, tapering to base, caudate-attenuate, acute, petiole about ¼ in., stipular sheath truncate or nearly so; fl. rather large, on long glabrous ped., 5 in cyme; cal. glabrous, wide, shortly 5-toothed; cor.-tube ⅜ in., slightly funnel-shaped, glabrous within, lobes 5, shorter than tube, lanceolate, acute; anth. sessile; berry depressed-globose, nearly ½ in. diam., dark blue, seeds 2.

Var. β, **Gardneri,** *Clarke, l. c.* *G. Gardneri*, Thw. l. c. C. P. 346.

Young parts puberulous; l. smaller, not over 2 in., linear, extremely acute; fl. solitary or 3 together; cal.-segm. longer; cor. larger.

Forests of montane zone, 3000–6500 ft., rather common. Abundant about N. Eliya. Var. β, Adam's Peak. Fl. March, April, September; white.
Endemic.
This has much the appearance of *Saprosma zeylanicum* among the *Rubiaceæ*. Var. β is perhaps a hybrid with the next, or a connecting form which would lead one to combine the two supposed species.

4. **G. ternifolia,** *Thw. Enum.* 202 (1861). [PLATE LXIV.]
G. Walkeri, var. *angustifolia*, Benth. in Journ. Linn. Soc. i. 11. C. P. 440.
Fl. B. Ind. iv. 92.

A small erect shrub, 4–6 ft., branchlets numerous, cylindrical, with 3 raised ridges, pubescent; l. very numerous, in closely placed whorls of three, small, ½–¾ in., subsessile, very acute at both ends, mucronate, rigid, with midrib prominent beneath, stipular sheath short, produced into acuminate points; fl. solitary, terminal, nodding; ped. puberulous, bracteate; cal.

puberulous, segm. lanceolate, acute; cor.-tube $\frac{1}{3}$ in., funnel-shaped, slightly hairy in throat, lobes 5, lanceolate, shorter than tube; berry $\frac{1}{4}$–$\frac{1}{3}$ in., nearly globose, blue.

Montane zone, 4000–6000 ft., rare. Forests on Adam's Peak and adjacent parts of Maskeliya and Ambagamuwa. Fl. March; white.

Endemic.

Though very distinct in its extreme narrow-leaved form, intermediates are found between this and the last. Some of these, collected between Madagama and Bogawantalawa in 1866, Thwaites considered 'certainly hybrids.'

LXXXVII.—GENTIANACEÆ.

HERBS, rarely aquatic, l. opp. (alt. in *Limnanthemum*), entire, fl. regular or slightly irregular, bisexual, usually in dichotomous cymes; cal. free, persistent, segm. 4–7; cor. rotate (rarely campanulate or tubular), lobes 4–7 (two lower connate in *Canscora*), contorted (valvate in *Limnanthemum*); stam. 4–7, inserted in throat or tube of cor., opening by slits or pores; ov. superior, 1-celled (2-celled in *Exacum*), with numerous ovules, style simple, stigmas 2; fruit a capsule (a berry in *Crawfurdia*); seeds numerous, with copious endosperm.

Terrestrial; l. opp.; cor.-lobes contorted.
  Ov. 2-celled . . . . 1. EXACUM.
  Ov. 1-celled.
    Cor. irregular; 1 perfect stam.
      Cor.-lobes slightly unequal . . . 2. HOPPEA.
      Cor. with 2 lower lobes connate . . 3. CANSCORA.
    Cor. regular; all stam. perfect.
      Cor.-lobes 5, without glandular pits at base.
        Erect, fl. in axillary clusters . . 4. ENICOSTEMA.
        Erect, fl. solitary, terminal . . . 5. GENTIANA.
        Twining; fruit a berry . . . 6. CRAWFORDIA.
      Cor.-lobes 4, with glandular pits . . 7. SWERTIA.
Aquatic; l. alt.; cor.-lobes valvate (*Menyantheæ*) 8. LIMNANTHEMUM.

We have but nineteen species of this mainly temperate Order. They are mostly found in the low country; *Exacum pedunculatum*, *Enicostema*, and 2 species of *Canscora* being restricted to the dry region, and *Hoppea* and two species of *Limnanthemum* to the wet country. The upper montane zone affords *Exacum Walkeri* and *E. macranthum*, *Crawfurdia*, and the solitary species of *Swertia* and *Gentiana*. *Swertia* and four species of *Exacum* are endemic.

1. EXACUM, *L.*

Erect annual herbs, stem more or less quadrangular, l. opp., entire, glabrous, 3- or 5-nerved, fl. in large leafy terminal dichotomous cymes; cal. generally papery, veined, enlarged and persistent with fruit, segm. 4 or 5, usually winged on back; cor. rotate, usually persistent with fruit, lobes 4 or 5, contorted; stam. 4 or 5, inserted in throat of cor., anth. large opening by terminal pores; ov. 2-celled, with numerous ovules in each cell, style long, curved, stigma capitate; capsule septicidally 2-valved; seeds minute, numerous, angular.—Sp. 20; 16 in *Fl. B. Ind.*

Cal.-segm. with a prominent wing on back.
  Cor.-lobes 4.
    Cor. 1 in. diam. . . . . . . 1. E. AXILLARE.
    Cor. $\frac{5}{8}$ in. diam. . . . . . . 5. E. PEDUNCULATUM.
  Cor.- lobes 5.
    Fl. white, cor.-lobes acute . . . 2. E. WALKERI.
    Fl. blue.
      Cor.-lobes obtuse or subacute . . 3. E. ZEYLANICUM.
      Cor.-lobes acuminate, acute . . 4. E. MACRANTHUM.
Cal.-segm. not winged; cor.-lobes 4 . . 6. E. SESSILE.

1. **E. axillare,** *Thw. Enum.* 203 (1861).
C. P. 2998.
Fl. B. Ind. iv. 96.

Stem 1–1½ ft., quadrangular, narrowly winged at angles, glabrous; l. 1½–2½ in., oval, much tapering to base and apex, acute, glabrous, 3-nerved, very thin when dried, petiole obscure; fl. numerous, solitary in l.-axils or from the forks of the branches, on short curved nodding quadrangular ped., cal.-segm. 4, very acute, wings semi-cordate at base, oblique, veined; cor. about 1 in. diam., lobes 4, lanceolate, very acute, anth. barely ¼ in., straight, suddenly narrowed into short blunt beak; capsule ¼ in., oblong, tipped by long persistent style.

Moist region below 1000 ft., rare. About Hewesse, Pasdun Korale abundant; Udugama. Fl. Dec.–March; bright clear violet-blue with a yellow eye.

Endemic.

The flowers are occasionally found 5- or even 6-fid (var. *pentamera*, Clarke).

2. **E. Walkeri,** *Arn. in Nat. Hist.* iii. 89 (1839).
Thw. Enum. 203. C. P. 1878.
Fl. B. Ind. iv. 96 (in part).

Stem 1–1½ ft., quadrangular, glabrous, slightly branched; l. 1–2 in., ovate or ovate-oval, rounded or subacute at base,

acute, glabrous, 3- (or 5-) nerved, firm, petiole very short; fl. on long nodding ped., in the forks of the branches and pseudo-axillary; cal.-segm. lanceolate, acuminate, very acute, wing rather narrow, rounded (not semi-cordate) at base; cor. 1¼ in. diam., lobes 5, lanceolate, acute; anth. ⅙ in., not beaked; capsule ⅜ in., broadly ovoid, tipped with a hard beak.

Upper montane zone, 5000–6000 ft., rare. About Nuwara Eliya; Adam's Peak; Horton Plains. Fl. Feb., Sept.; pure white with greenish eye.

Endemic.

Easily recognised by its always white flowers with acute lobes.

3. **E. zeylanicum,** *Roxb. Cat. Pl.* 83 (1813). **Bindara, Ginihiriya,** *S.*

Herm. Mus. 33. Burm. Thes. 104, 145. Fl. Zeyl. n. 90. *Chironia trinervia*, L. Sp. Pl. 189. Moon Cat. 16. Thw. Enum. 203. C. P. 512. Fl. B. Ind. iv. 97. Burm. Thes. t. 67. Bot. Mag. t. 4423.

Stem 1–2½ ft., stout, more or less quadrangular, branched above; l. nearly or quite sessile, 2½–3½ in., ovate or narrowly lanceolate, tapering to base, much attenuate, very acute, rather thick, strongly 3-nerved; fl. numerous, cymes large, leafy; cal.-segm. lanceolate, very acuminate, wing rounded or narrowed at base; cor. 1½–1¾ in. diam., lobes 5, oval or obovate-oval, usually very obtuse; anth. ⅓–½ in., slightly tapering upwards; capsule ⅜–½ in.

Var. β, **pallidum,** *Trim.* C. P. 38.

L. broader, less acuminate; fl. smaller, lobes often sub-acute, anth. smaller, about ⅙ in.

Moist region, very common; the type up to 4000 ft. Var. β throughout the montane zone to the highest elevations. Fl. Aug.–October, also Dec.–Feb.; brilliant blue, in var. β paler.

Endemic.

One of our commonest and most beautiful flowers, now well known in cultivation at home. A bitter tonic; given in mild fevers. Var. β is referred in Fl. B. Ind. to *E. Walkeri*, on account of the shorter anthers. But these vary considerably, and in other respects the plant is nearer *E. zeylanicum.* Wight, Ill. t. 157 b, f. i. (called *E. Walkeri*), represents this. It is scarcely deserving of separation.

4. **E. macranthum,** *Arn. in Ann. Nat. Hist.* iii. 88 (1839).

Griseb. in DC. Prod. ix. 46. Thw. Enum. 203. C. P. 1877. Fl. B. Ind. iv. 97 (*E. zeylanicum*, var.). Bot. Mag. t. 4771.

Stem 1–1½ ft., stout, nearly cylindrical below, bluntly quadrangular above, slightly branched; l. sessile, 2½–4½ in., broadly or narrowly lanceolate, tapering to broad base, acute, rather thick, margin slightly reflexed, strongly 3- (or 5-) nerved, nerves pellucid, prominent beneath, glaucous green and paler

beneath; infl. as in *E. zeylanicum;* cal.-segm. lanceolate-linear, acuminate, with membranous margins, wing rounded at base; cor. 1¾–2 in. diam., lobes 5, oval-lanceolate, slightly narrowed at base, acuminate, acute; anth. ⅜–½ in., tapering to end; capsule ¾ in., ovoid, beaked.

Upper montane zone, in moist places on the patanas, 5000–7000 ft., rather rare. About N. Eliya frequent. Fl. Sept., April, June; deep purplish-blue, with a pale-yellow eye.

Endemic.

This is certainly very closely allied to *E. zeylanicum*, and is perhaps, as regarded by Clarke, merely a variety of it. The intense lustrous glowing purple-blue of the flowers is very striking; and the Bot. Mag. figure of cultivated specimens gives but a poor idea of this magnificent flower in its native home. A remarkable variety was gathered (by Miss Baker) in 1882 with pure white flowers, having the corolla-segments jagged at the margins.

E. ovale Griseb. in DC. Prod. ix. 46 (Walker at 6000 ft.) is a doubtful name. Thwaites refers it to the present species; Clarke thinks it was, doubtless, *E. Walkeri.*

5. **E. pedunculatum,** *L. Sp. Pl.* 112 (1753).

Herm. Mus. 57. Burm. Thes. 146. Fl. Zeyl. n. 473. Moon Cat. 10. Thw. Enum. 203. Arn. in Ann. Nat. Hist. iii. 89. C. P. 1876.

Fl. B. Ind. iv. 97. Wight, Ic. t. 336 (*E. pedunculare*). Burm. Thes. t. 63, f. 2.

Stem 6–12 in., much branched above, slender, quadrangular; l. on very short petioles, 1½–2 in., oval, tapering to both ends, acute, 3- (or 5-) nerved; fl. on long rigid ped., rather small; cal.-segm. ovate, very acute, wings wide, cordate or subcordate at base, strongly veined; cor. ⅝ in. diam., lobes 4, lanceolate, acute; anth. 4, $\frac{1}{10}$ in., not tapering; capsule globose.

Var. β, **petiolare,** *Griseb. in DC. Prod.* ix. 46 (sp.). *E. carinatum*, Roxb. Fl. Ind. ed. Carey & Wall. i. 415 (?). Clarke in Journ. Linn. Soc. xiv. 427. Trim. in Journ. Bot. xxvii. 164. Wight, Ic. t. 1324, f. 2.

L. distinctly petioled, broader, 5-nerved.

Dry and intermediate region; rather common. Jaffna; Trincomalie; Batticaloa; Polonarua; Bintenne; Nalande; Bibile. Var. β, Kannia near Trincomalie (Ferguson). Fl. Jan.–March; pale violet-blue or white, with a yellowish centre.

Also in Peninsular India.

There are no specimens in Hermann's Herb. Petiver erroneously gives the Sinhalese name 'Giritilla' for this, and is followed by Burman. The original description (by Plukenet) gives yellow for the flower, but was probably taken from a dried specimen. But it is curious that Roxburgh both describes and figures his *E. carinatum* (from Ceylon) as having yellow flowers (which are not known to occur in any of our species).

I cannot find any means of distinguishing *E. petiolare* as a species, though it is maintained in Fl. B. Ind.

6. **E. sessile,** *L. Sp. Pl.* 112 (1753).

Herm. Mus. 36. Burm. Thes. 57. Fl. Zeyl. n. 61. Vahl, Symb. Bot. iii. 16. Moon Cat. 10. Thw. Enum. 203. C. P. 250.

Fl. B. Ind. iv. 98. Wight, Ic. t. 1324, f. 1.

Stem 4–12 in., slender, quadrangular, branched above; l. very small, $\frac{1}{4}$–$\frac{3}{8}$ in., sessile, ovate, rounded at base, obtuse, apiculate, obscurely 3-nerved; fl. few, nodding, on short curved ped.; cal.-segm. ovate, acute, without wings; cor. under $\frac{1}{2}$ in. diam., lobes 4, broadly oval, obtuse; anth. not tapering; capsule globose.

Moist low country and up to 4000 ft.; rather common. Fl. April, August, Dec.; dark bright-violet.

Also in S. India (?).

Again there is discrepancy in book-descriptions of the colour of the flowers. Hermann says yellow, the Fl. B. Ind. white; both incorrect as far as Ceylon is concerned. A dwarf uniflorous state, under 2 in. high, occurs in the hills.

2. HOPPEA, *Willd.*

Small annual herb, l. opp., sessile, fl. small, in dense dichotomous cymes; cal. tubular, membranous, segm. 4, lanceolate, strongly aristate; cor. tubular, lobes 4, unequal, shorter than tube, contorted; stam. inserted in cor.-throat, 1 perfect, 3 barren; ov. 1-celled with 2 placentas, style short; capsule globose, septicidally 2-valved; seeds very minute.—Sp. 2; both in *Fl. B. Ind.*

H. fastigiata, *Clarke in Fl. B. Ind.* iv. 100 (1883).

Cicendia fastigiata, Griseb. in DC. Prod. ix. 62. *Pladera pusilla* Thw. Enum. 204, 425 (non Roxb.). *P. fastigiata*, Clarke in Journ. Linn Soc. xiv. 429. C. P. 2840.

Fl. B. Ind. iv. 100. Wight, Ill. t. 157 b, f. ii. B.

Stem 2–4 in., stout, quadrangular, strongly winged at angles, glabrous, branched above; l. sessile, $\frac{1}{6}$–$\frac{1}{4}$ in., subrotundate, obtuse, glabrous; fl. small, nearly sessile, in forks of cyme-branches; cal.-segm. longer than tube, with a thickened margin; cor. longer than cal., lobes lanceolate, acute, slightly unequal.

Moist low country; rare. Peradeniya (Gardner); Galle. Fl. Dec.; white.

Also in S. India and Burma.

Grisebach's specimens were from Macrae. I have never met with this plant.

3. CANSCORA,* *Lam.*

Annual erect herbs, branched above, stems quadrangular,

---

* *Cansjancora* is the native name given by Rheede for *C. perfoliata* in Hort. Malab. x. 103.

winged, l. few, opp., upper ones smaller and bractlike; fl. moderate-sized, in large lax cymose inflorescence; cal. tubular, segm. 4, short, acuminate, sometimes winged on back; cor. irregular, apparently 3-lobed or somewhat 2-lipped, the upper lip of 2 rounded broad lobes, the lower of 2 narrower ones connate nearly to apex; stam. 4, 1 only usually fertile and inserted somewhat higher in the cor.-tube between the 2 narrower cor.-lobes; ov. 1-celled, placentas 2, with numerous ovules, stigmas 2 short; capsule septicidally 2-valved; seeds minute, polyhedral.—Sp. 14; 12 in *Fl. B. Ind.*

Cal. not winged.
  None of the leaves connate at base.
    Fl. pedicellate . . . . 1. C. DIFFUSA.
    Fl. sessile . . . . 2. C. SESSILIFLORA.
  Uppermost pairs of leaves connate . . . 3. C. ROXBURGHII.
Cal. 4-winged . . . . 4. C. DECUSSATA.

1. **C. diffusa,** *Br. Prod. Fl. Nov. Holl.* 451 (1810).
Exacum diffusum, Willd., Moon Cat. 11. Thw. Enum. 204. C. P. 2841.
Fl. B. Ind. iv. 103. Wight, Ic. t. 1327, f. 3 (*C. tenella*).

Stem 10–15 in., slender, much branched, glabrous; l. few, lowest ones about ½ in., sessile, ovate-oval, acute or obtuse, upper ones much smaller, linear; fl. on long slender ped., cymes large, lax, diffuse; cal. strongly striate, segm. not winged, short, acuminate, very acute; cor.-lobes obtuse, capsule oblong, as long as cal., valves recurved.

Grassy places up to 4000 ft.; rather rare. Pusselawa; Hantane; Bintenne. Moon's locality is Jaffna. Fl. October.
Also in India, Malaya, E. Trop. Africa, and Trop. Australia.

2. **C. sessiliflora,** *R. & S. Syst.* iii. *Mant.* 230 (1827).
Exacum heteroclitum, Willd., Moon Cat. 11. Thw. Enum. 204. C. P. 3581.
Fl. B. Ind. iv. 104.

Stem 3–9 in., branched above, wings wide; l. few, lowest ones broadly ovate-oval, obtuse, sessile, upper ones very small, linear; fl. sessile, cymes large, diffuse; cal. striate, not winged, segm. short, linear-lanceolate, very acute; cor.-lobes rounded, obovate.

Dry country; rather rare. Jaffna; Batticaloa; Trincomalie; Seven Korales. Fl. Oct.–Feb.; rose-coloured.
Also in S. India.

3. **C. Roxburghii,** *Arn. in Miq. Anal. Bot. Ind.* iii. 10 (1852).
Exacum connatum, Moon Cat. 11. Thw. Enum. 442, and *C. perfoliata*, 204. C. P. 1874.
Fl. B. Ind. iv. 105 (*C. Wallichii*). Wight, Ic. t. 1327, f. 2 (*C. perfoliata*).

Stem 9–15 in., slender; lower l. 1–1¾ in., sessile, oblong-lanceolate, acute at both ends, 3-nerved, upper ones smaller, uppermost connate forming a suborbicular perfoliate bract; fl. numerous, on quadrangular but scarcely winged ped.; cal. ½ in., narrow, scarious, striate, without wings, segm. lanceolate-linear, acuminate; cor.-lobes rather narrow, obtuse; capsule shorter than cal.

Dry region; rare. Jaffna (Moon); Kachavalli (Gardner); Trincomalie (Glenie). Fl. Jan., Feb.
Also in S. India.
Clarke (in Fl. B. Ind.) appears to have overlooked Arnott's name for this species, and has bestowed a new one.

4. **C. decussata,** *R. & S. Syst.* iii. *Mant.* 229 (1827).
Thw. Enum. 204. C. P. 2400.
Fl. B. Ind. iv. 104. Bot. Mag. t. 3066 (*Pladera decussata*).

Stem 6–18 in., branched above; l. rather numerous, sessile, lowest ones about 1 in., upper ones smaller, all ovate- or oblong-lanceolate, rounded at base, acute, 3-nerved; cymes few-flowered, very lax, ped. long, quadrangular, strongly winged; cal. nearly ½ in., 4-winged, segm. very short, lanceolate, very acute; cor.-lobes rounded, 2 lower ones much narrower.

Wet places up to 4000 ft.; rather rare (?). Near Badulla; Hantane; Trincomalie. Fl. Feb.–April; pale yellow.
Also in India, Mascarene Islands, and Trop. Africa.

4. ENICOSTEMA, *Bl.*

Perennial herb, l. opp., fl. in sessile axillary clusters; cal.-segm. 5, deep; cor. tubular, lobes 5, slightly contorted; stam. 5, inserted in cor.-tube; ov. 1-celled, ovules numerous on 2 parietal placentas, stigma capitate; capsule ovoid, septicidally dehiscent, seeds numerous, subglobose, reticulate.—Monotypic.

E. littorale, *Bl. Bijdr.* 848 (1826). **Vellaruku,** *T.*
Slevogtia orientalis, Griseb., Thw. Enum. 204. C. P. 1871.
Fl. B. Ind. iv. 101. Hook. Comp. Bot. Mag. ii. t. 28 (*Cicendia hyssopifolia*). Wight, Ic. t. 600 (*Adenema hyssopifolium*).

Stems several from a woody base, erect or procumbent, 6–18 in., sub-quadrangular, glabrous; l. numerous 1–1¾ in.,

oblong-oval to oblong-linear, sessile, tapering to base, obtuse, rather thick, 3-nerved, the lat. nerves marginal and faint, pale glaucous green; fl. numerous, crowded; cal. glabrous, segm. lanceolate, subacute; cor. much longer than cal., tube wide, lobes much shorter than tube, oval, acute; stam. included; capsule about $\frac{1}{4}$ in.

Sandy ground in the dry region, usually on the seacoast; common. Fl. all the year; white.

Also in India, Malaya, Trop. Africa, and W. Indies.

The whole plant is very bitter.

5. **GENTIANA,** *L.*

Perennial herb, l. opp., numerous, fl. solitary, terminal, rather small; cal.-segm. 5, acute; cor. widely funnel-shaped, with folds between the lobes, lobes 5, shorter than tube, spreading, contorted; stam. 5, inserted near base of cor.-tube, included; ov. 1-celled with 2 parietal placentas, stigmas 2, divergent; capsule stalked, septicidally 2-valved; seeds very numerous, trigonous.—Sp. 180; 37 in *Fl. B. Ind.*, all Himalayan and only the following one reaching the S. Indian mountains.

G. quadrifaria, *Bl. Bijd.* 847 (1826).

G. zeylanica, Griseb. in DC. Prod. ix. 108. *G. pedicellata*, Wall., Thw. Enum. 204. C. P. 1873.

Fl. B. Ind. iv. 111. Wight, Ic. t. 1328 (*G. pedicellata*).

Stems numerous, 4–8 in., lax, procumbent or ascending, quadrangular, glabrous, corymbosely branched above; l. very numerous, rather crowded, decussate, sessile, $\frac{1}{4}$ in. or less, broadly ovate or rotundate, rounded at base, apiculate, thick, shining; fl. nearly sessile, terminating the numerous branches, thus giving the appearance of a corymbose infl.; cal. glabrous, segm. oblong-oval, with a shortly spreading mucronate apex; cor. under $\frac{1}{2}$ in. diam., lobes lanceolate, acute, bristle-pointed, folds bifid; capsule $\frac{1}{6}$ in., ovoid, elevated on a stalk $\frac{1}{4}$ in. long and exserted beyond the persistent cal. and cor., valves recurved, yellow, tipped with the styles.

Upper montane zone, on patana land above 6000 ft.; common. Fl. all the year; pale but brilliant blue.

Also in the mountains of India, Burma, Java, and in China.

The only true Gentian in Ceylon, and the flowers, though small, have the intense blue of some of the favourite alpine species. The yellow exserted capsules after dehiscence are constantly mistaken for flowers—hence, no doubt, the colour, 'yellowish-green,' given for the flowers in Fl. B. Ind.

6. **CRAWFURDIA,** *Wall.*

Perennial twining herb, l. opp., fl. solitary, axillary; cal. tubular, segm. 5, linear, distant; cor. tubular-campanulate, plicate between the lobes, lobes 5, short; stam. 5, inserted in middle of cor.-tube; ov. shortly stalked, 1-celled with 2 parietal placentas, stigmas 2, linear; fruit an indehiscent berry, on a long stalk exserted from persistent cor.; seeds numerous, acutely trigonous.—Sp. 10; 7 in *Fl. B. Ind.*, but none in Peninsular India

C. japonica, *Sieb. & Zucc. Fl. Jap. Fam. Nat.* ii. 36 (1846), var. **Championii,** *Clarke, l. c.* 108. [PLATE LXV.]
Tripterospermum Championi, Gardn. in Calc. Journ. Nat. Hist. viii. 15. *C. fasciculata*, var. *Championi*, Thw. Enum. 204, (non Wall.). C. P. 137.
Fl. B. Ind. iv. 108.

Stems very slender, twining, cylindrical, glabrous; l. small, about 1 in., ovate-oval, rounded and then suddenly narrowed at base, very shortly acuminate, acute, glabrous, 3-nerved, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. rather large, nearly sessile; cal. glabrous, thin, segm. as long as tube; cor. 1 in. long, tube much exceeding cal., lobes triangular, very acute, spreading; stigmas exserted, recurved; berry $\frac{3}{8}$ in., ovoid, succulent, red, stalk $\frac{1}{2}$ in.

Upper montane zone; very rare. Only found on Horton Plains at about 7000 ft. Fl. Feb. and Aug.

The type in the East Himalaya, China, Formosa, Japan. The var. endemic.

Discovered by Capt. Champion in 1843; again found sparingly by Gardner in 1847 and by Thwaites in 1856; not since seen.

7. **SWERTIA,** *L.*

Annual (?) herb, l. opp., fl. moderate-sized in dense corymbose cymes; cal. very deeply cut into 4 almost distinct sep.; cor. cup-shaped, lobes 4, deep, erect, contorted, each with a large circular pit at the base; stam. 4, inserted at base of cor., fil. rather long; ov. 1-celled, with 2 parietal placentas, stigmas 2; fruit a capsule, sessile; seeds numerous, reticulate. —Sp. 50; 30 in *Fl. B. Ind.*, nearly all Himalayan.

S. zeylanica, *Walker ex Griseb. Gent.* 316 (1839).
Ophelia zeylanica, Griseb. in DC. Prod. ix. 125. Thw. Enum. 205. C. P. 1875.
Fl. B. Ind. iv. 127.

Stem 6–18 in., erect, cylindrical or with 4 slightly elevated ridges, glabrous, branched above; l. $\frac{1}{2}$–1 in., numerous, sessile,

oval or lanceolate, subacute, somewhat induplicate, thick, curved, uppermost ones bract-like; fl. numerous, on long erect ped., cymes trichotomous, flat-topped; cal.-segm. linear, acute, glabrous; cor. about ⅓ in. diam., lobes oval, acute, pits with the margin shortly fimbriate but without a scale.

Upper montane zone, on the patanas above 6000 ft.; common. Fl. Nov.–February; pale bluish-violet.

Endemic.

[*S. Chirata*, Ham. Given for Ceylon in Thw. Enum. 426 with the locality, 'Central Province, rare.' The C. P. specimens, 3723, which are the right plant, bear the locality, 'Near Ratnapura (?) 1860.' Some error is undoubted, as *S. Chirata* is an Alpine Himalayan species only. It is the true Chiretta of the Pharmacopœia, and is figured in Bentl. & Trim. Med. Pl. t. 183.]

8. **LIMNANTHEMUM,** *Gmel.*

Usually aquatic herbs with submerged stems and alt. floating l., fl. in sessile umbels at the nodes; cal.-segm. 4–7, very deep, narrow; cor. rotate, lobes 4–7, induplicate-valvate, usually hairy or with a median crest; stam. 4–7, inserted on cor.-tube, ov. 1-celled, placentas 2, parietal, stigmas 2; fruit an ovoid or globose capsule, thin, irregularly dehiscent; seeds numerous, globose, usually muriculate.—Sp. 14; 6 in *Fl. B. Ind.*

Stems petiole-like with a single leaf at end (node); fl. white.
  Cor. over ½ in., lobes 5–7.
    Cor.-lobes hairy, without a crest . . . 1. L. INDICUM.
    Cor.-lobes glabrous, with a longitudinal crest. 2. L CRISTATUM.
  Cor. under ½ in., lobes 4, fimbriate . . . 3. L. PARVIFOLIUM.
Stems with several nodes and alt. l.; fl. yellow . 4. L. AURANTIACUM.

1. **L. indicum,** *Thw. Enum.* 205 (1861). **Olu, Maha-ambala,** *S.*

Herm. Mus. 19. Fl. Zeyl. n. 72. *Menyanthes indica*, L. Sp. Pl. 145; Moon Cat. 13. *L. Wightianum*, Griseb. in DC. Prod. ix. 139. Thw. Enum. 205. C. P. 3152.

Fl. B. Ind. iv. 131. Hook. Bot. Misc. iii. t. suppl. 30 (*Villarsia indica*).

Rhizome horizontal or oblique with numerous long roots, giving off from the axils of broad-based, sheathing, ovate, attenuate, very acute, membranous, reflexed leaf-scales, numerous erect, very long, flexible, cylindrical, unbranched, slightly rough petiole-like branches which reach the surface of the water and there produce a node from which is developed a tuft of roots, an umbel of flowers, a single floating l. and a single branch which again proceeds in the same manner; floating l. 4–10 in., rotundate, deeply cordate with

obtuse lobes and a triangular sinus, faintly and coarsely crenate, rather thick, glabrous, strongly involute in bud; petiole stout, $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. over 20 in the umbel, ped. 2–4 in., bracts ovate, acute, membranous; cor. 1$\frac{1}{4}$ in. diam., lobes usually 6, oblong-oval, obtuse, densely covered above with copious long cottony papillose hair; capsule nearly globose; seeds 30 or more, not muriculate, shining, yellow.

Ponds and shallow streams in the moist low country up to 1500 ft.; very common. Fl. all the year; white, with a yellow centre.

Throughout the Eastern Tropics and Mascarene Islands.

This familiar small water-lily (and also *L. cristatum*) has a peculiar method of growth. The erect branches of the rhizome look precisely like the petioles of the floating l., appearing strangely to give off flowers near their summit. The actual articulation of the really short petiole with the branch can, however, easily be seen, and at the same point on the upper side (apparently lateral) arises a bud (at first enclosed in bracts), from which is developed the inflorescence, a number of rootlets and (from a point above the flowers from a leaf-scale like those on the rhizome) a new branch. The flowers appear above the surface of the water between the lobes of the l., the outer ones opening first, the unopened buds being immersed in colourless jelly; they sink to mature the seed. They are dimorphic, and the earliest name, *L. Wightianum*, Griseb., refers to the long-styled form only.

2. **L. cristatum,** *Griseb. in DC. Prod.* ix. 139 (1845). **Kin-ambala,** *S.*

Menyanthes cristata, Roxb., Moon Cat. 13. Thw. Enum. 205. C. P. 1870.

Fl. B. Ind. iv. 131. Roxb. Cor. Pl. ii. t. 105. Wight, Ill. t. 157 b, f. 4.

Rhizome short, erect, branches as in *L. indicum* but shorter and more slender, floating l. as in the last but smaller, 3–4$\frac{1}{2}$ in., purplish beneath with broad green veins; petiole $\frac{1}{4}$–1 in., fl. numerous, ped. $\frac{3}{4}$–2 in., slender, glabrous; cor. $\frac{5}{8}$ in. diam., lobes obovate, rounded, with a wide undulated longitudinal wing or crest down the centre, margin somewhat undulated, not hairy or ciliate; capsule broadly ovoid; seeds 10 or more, globose, strongly muriculate, pale yellow-brown.

Ponds and shallow water in the low country below 1000 ft.; rather common. Fl. Aug., Sept.; white.

Also in India and China.

3. **L. parvifolium,** *Griseb. in DC. Prod.* ix. 141 (1845). **Bin-olu,** *S.*

Menyanthes campestris, Moon Cat. 13. *L. Moonii*, Thw. Enum. 205. C. P. 2842.

Fl. B. Ind. iv. 132.

Aquatic or terrestrial, rhizome small, erect, with numerous roots, branches very slender, 3–12 in. (according to situation), erect, pellucid, producing from the terminal bud a single l.

and the umbel of fl. but no roots nor any branch; l. of two kinds, radical ones forming a rosette, about ½ in., spathulate or deltoid, obtuse, on long broad petioles, and floating ones ½–¾ in., broadly oval, deeply cordate with oblong lobes and a widely triangular sinus, with petiole ¼–¾ in., cor. small, about ⅓ in. diam., lobes 4, oblong, subacute, fimbriate, slightly pilose; capsule globose, apiculate; seeds 15 or more, finely muriculate.

In ponds or on wet ground in the moist low country; rare. Kalutara; Weligama; Colombo. Fl. Sept.–December; white.

Also in S. India and Burma.

Our plant varies greatly in size and appearance, according to the growth on land or in water. Moon's are terrestrial, hence his name, *campestris;* but I cannot see any distinct variety as given in Fl. B. Ind.

4. **L. aurantiacum,** *Dalz. in Kew Journ. Bot.* ii. 136 (1850).
Menyanthes biflora, Moon Cat. 13. *L. biflorum*, Thw. Enum. 205. C. P. 1869.
Fl. B. Ind. iv. 132.

Rhizome elongated, branches few, very long, not petiole-like but with several nodes producing l. and fl.; l. obviously alt., 1¼–2 in., oval-rotundate, deeply cordate with subacute lobes and a narrow sinus, rounded at apex, purple and dotted with black glands beneath, petiole longer than l. (of the radical l. 4–6 in.), dilated and stem-clasping at base; fl. few, 1–3, opp. the l. at the nodes, with an oblong bract beneath; cal.-segm. acute; cor. nearly ½ in. diam., lobes 5, fimbriate; capsule globose; seeds about 20, rather large, globose, very finely pubescent.

Moist low country; very rare. Only about Kalutara and other parts of Pasdun Korale, where it was first noticed by Moon. Fl. Sept.–Dec.; yellow.

Also in S. India.

The stems, petioles, and ped. are usually purplish-red.

[*L. Forbesianum*, Griseb. in DC. Prod. xi. 139, is partly based on specimens from Macrae from Kalutara, and the species is maintained in Fl. B. Ind. The specimens (Macrae, Nos. 86 and 87) are in Herb. Kew, and appear to be precisely *L. aurantiacum;* and Macrae's note that the fl. are 'white' is, doubtless, an error of observation.]

LXXXVIII.—HYDROPHYLLACEÆ.

ANNUAL herb, l. alt., without stip., fl. in racemes; cal.-segm. (sep.) 5; cor. rotate, lobes 5, deep, imbricate; stam. 5, inserted in cor.-tube; ov. 2-celled with very numerous ovules in each cell, styles 2; fruit a capsule, dehiscing septicidally by 2 valves, seeds numerous, minute, with endosperm.

A rather small Family, mostly American. The following is the only Indian genus.

HYDROLEA, *L.*

For characters, see Order.—Sp. 14; 1 in *Fl. B. Ind.*

H. zeylanica, *Vahl, Symb. Bot.* ii. 46 (1791). **Diya-kirilla,** *S.*
Herm. Mus. 36. Fl. Zeyl. n. 117. *Nama zeylanica,* L. Sp. Pl. 226. Moon Cat. 21. Thw. Enum. 209. C. P. 1883, 1884.
Fl. B. Ind. iv. 133. Fl. Zeyl. t. 2. Wight, Ill. t. 167, Ic. t. 601.

Annual herb, stem 6–18 in., usually decumbent and rooting at the nodes below, glabrous, rather succulent, with short branches; l. 1–2½ in., linear-oblong, shortly petioled, acute at both ends, glabrous but slightly ciliate on the margin; fl. very numerous, ped. rather long, curved, glabrous or with numerous short glandular hairs, cymes racemose, bracts leafy; sep. about ¼ in., oblong-linear, glabrous or with copious glandular hairs, cor. nearly ½ in. diam., lobes ovate, acute; stam. exserted, fil. dilated at base; styles long, spreading; capsule ovoid-oblong, shorter than persistent enclosing sep.

Wet places, margins of tanks, &c., in the low country, especially in the dry region; rather common. Fl. March and Sept.; bright light blue.

Throughout the Tropics of both hemispheres.

The perfectly glabrous type is confined to the moist region, the commoner plant of the dry country is smaller, more prostrate, and more branched, and has the cal. and inflorescence viscous-hairy.

Linnæus's genus *Nama* is older than his *Hydrolea;* but the present species is not congeneric with the other one, *N. jamaicensis*, L., and was properly transferred by Vahl to *Hydrolea*, of which *H. spinosa* was Linnæus's only species.

LXXXIX.—BORAGINEÆ.

TREES, shrubs, or herbs, l. alt. (rarely opp.) without stip.; fl. regular, bisexual (rarely polygamous), in corymbose or racemose and scorpioid cymes, or solitary; cal. free, persistent, segm. 5–8; cor. tubular funnel-shaped or rotate, lobes 5–8, imbricate; stam. 5–8, inserted on cor.-tube; ov. superior, 2-celled, with 2 ovules in each cell or 4-celled with 1 ovule in each, styles 1 or 2; fruit usually of 4 readily separable 1-seeded pyrenes or achenes or a drupe; seeds with or without endosperm.

Fruit a drupe with a single 1–4-celled pyrene; style twice bipartite (*Cordieæ*)	1. CORDIA.
Fruit fleshy or dry, with four 1-celled or two 2-celled pyrenes.	
Style bifid or 2; shrubs	2. EHRETIA.
Styles 2; annual herb	3. COLDENIA.
Style unbranched, long; shrub	4. RHABDIA.
Style 0; shrubs	5. TOURNEFORTIA.
Style unbranched, very short; herbs . . .	6. HELIOTROPIUM.
Fruit of 4 distinct achenes attached to central carpophore (*Borageæ*) (see also 6).	
Anth. connivent into an exserted cone. . .	7. TRICHODESMA.
Anth. distant, included in cor.-tube . . .	8. CYNOGLOSSUM.

A large Order of warm-temperate regions, poorly represented here. Of our 18 species, 8 are confined to the dry region, and only 2 to the moist; 2 species are found to ascend into the montane zone. There are only 2 endemic species.

1. **CORDIA,** *L.*

Small trees or shrubs, rarely subscandent, l. alt. (rarely sub-opposite), fl. polygamous (male and bisexual) in terminal corymbs; cal. tubular or campanulate, segm. very short, obscure, unequal; cor. funnel-shaped, lobes 5–8, imbricate; stam. 5–8, inserted in throat of cor., ov. 4-celled with 1 ovule in each cell, style terminal, long, deeply divided, the branches again bipartite, linear; fruit a drupe, pulp viscid, stone bony, usually 4-celled and 4-seeded, often 1-celled by abortion; seeds with plicate cotyledons, no endosperm.—Sp. 180; 15 in *Fl. B. Ind.*

Cor. under ½ in. diam., white.
  Drupe ovoid, not more than ½ in.
    L. glabrous on both sides . . . . . 1. C. MYXA.
    L. scabrous above, more or less tomentose beneath.
      L. ovate-oval . . . . 2. C. MONOICA.
      L. lanceolate-oblong . . . . . . 3. C. ROTHII.
  Drupe ovate-ovoid, over 1 in. . . . . . 4. C. OBLONGIFOLIA.
Cor. over 1 in. diam., orange . . . . . 5. C. SUBCORDATA.

1. **C. Myxa,** *L. Sp. Pl.* 190 (1753). **Lolu,** *S.* **Naruvili, Vidi,** *T.*

Moon Cat. 16. *C. Myxa*, var. *β*, *minor*, Thw. Enum. 214. C. P. 1880.

Fl. B. Ind. iv. 136. Wight, Ill. t. 169. Gaertn. Fruct. t. 76 (*Sebestena officinalis*).

A small tree, twigs slender, glabrous, buds pubescent; l. 2–4 in., broadly oval, acute at base, obtuse or subacute at apex, entire or more or less coarsely sinuate-serrate in upper half, glabrous on both sides, thick and hard, somewhat 3-nerved at base, petiole ¾–1¼ in., slender; fl. shortly pedicellate, corymbs branched, divaricate, lax; cal. tubular-campanulate, glabrous, pubescent within, segm. very shallow; cor.-lobes oblong, obtuse, recurved; drupe globular-ovoid, ½ in., apiculate, smooth, pinkish-cream-coloured, surrounded at base by a cup formed of persistent cal. which is ¼ in. deep, irregularly 5–10-lobed, longitudinally striate, glabrous.

Var. *β*, **obliqua,** *Willd.* (sp.) *C. Myxa* (type), Thw. Enum. 213. Rheede, Hort. Malab. iv. t. 37. C. P. 3650.

L. larger, 4–5 in., much thinner, petiole 1–1½ in.; fruit larger, ¾ in., persistent cal. ⅜ in. deep, nearly truncate with a few irregular teeth, not striate; stone 1-seeded.

Low country up to 2000 ft., chiefly in the dry region; common. Var. *β*, Kurunegala; about Kandy, &c. Fl. June, July; white.

Throughout the Eastern Tropics.

Var. *β* is, perhaps, a distinct species as considered in Fl. B. Ind.; it does not quite agree with *C. obliqua*, Willd., and appears to be a more luxuriant form.

The fruits are the Sebestens of the old writers on Materia Medica. The viscid glutinous pulp renders them valuable medicines in coughs, and the leaves are here used in the same complaints.

2. **C. monoica,** *Roxb. Cor. Pl.* i. 43 (1795). **Naruvili, Ponnaruvili,** *T.*

C. diversa, Thw. Enum. 214. C. P. 1954.

Fl. B. Ind. iv. 137. Roxb. Cor. Pl. t. 58 (not good).

A small tree, bark smooth, grey, young parts more or less densely tomentose; l. 2–4 in., ovate-oval, rounded or acute at base, obtuse, nearly entire or somewhat repand, very harsh

above with small white prominences, more or less tomentose or scabrous or nearly glabrous beneath, somewhat 3-nerved at base, petiole ½ in.; fl. subsessile, corymbs dense, shortly stalked; cal. funnel-shaped, tomentose, segm. very short, obscure; cor.-lobes oval, acute, reflexed; stam. exserted; drupe about ½ in., ovate-ovoid, apiculate, smooth, bright yellow, cup of enlarged persistent cal. loose, irregularly truncate, pubescent, stone 4-celled, 4-seeded.

Dry region; common. Fl. November; white.

Also in Peninsular India.

A variable plant in the size of the leaves and the amount of pubescence on their under side. Mr. Nevill sends from Kuchchavelli, E. Prov., a plant from 'exposed rocks near the sea,' with the leaves narrower, oval-oblong, and a larger fruit.

3. **C. Rothii,** *Roem. & Sch. Syst.* iv. 798 (1819).
Trim. in Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 138 (not given for Ceylon). Wight, Ic. t. 1379.

A small tree, 18–20 ft., branches drooping, twigs slender, glabrous; l. sub-opposite, small, 1½–2½ in., lanceolate-oblong, acute at base, obtuse at apex, slightly scabrous with minute white prominences above, slightly hairy especially in the vein-axils beneath, not at all 3-nerved at base, petiole ¼ in.; fl. not seen; drupe ⅓ in., ovoid, apiculate, glabrous, cup of enlarged cal. shallow, loose, irregularly lobed, glabrous, stone 1–3-seeded.

Dry and desert districts; rare. Kirinda, S. Prov.; Mandagala Tank, Kambukan Aru, E. Prov. (Nevill).

Also in Western India, Arabia, and Abyssinia.

Very near *C. Myxa.* I have not seen flowers.

4. **C. oblongifolia,** *Thw. Enum.* 214 (1861).
C. P. 2696.
Fl. B. Ind. iv. 138.

A straggling semi-scandent shrub, twigs glabrous; l. 3–6 in., oval or lanceolate-oval, acute at base, slightly acuminate, acute or apiculate, entire, smooth on both sides, or often with minute white scales above, petiole ¾–1½ in., articulated to a small horn-like projection on branch; fl. rather large, on stout pubescent ped., corymbs lax, spreading, paniculate; cal. tubular-funnel-shaped, rusty-puberulous or nearly glabrous outside, villous within, segm. 3, rounded, shallow; cor. over ½ in. diam., lobes 5–7, oblong-oval, as long as tube, recurved; drupe large, 1–1¼ in., ovoid, acuminate, stone furrowed and excavated.

Low country up to 2000 ft., rare; chiefly in dry region. Puttalam (Nevill); Allagala (Thwaites); Kirinda and Tissamaharama, S. Prov. Fl. Aug.-Dec.; white, sweet-scented.

Endemic.

Specimens from Topare without fl. or fruit, and with linear-lanceolate attenuate leaves, appear to be rightly referred to this species.

[*C. Roxburghii*, Clarke in Fl. B. Ind. iv. 138, is there given only for 'Ceylon, Herb. Roxburgh,' but the specimen at Kew (from Roxburgh's Herb.) is almost certainly from Brazil, and I am informed by Mr. Hemsley that it is *C. salicifolia*, Cham.]

5. **C. subcordata,** *Lam. Ill. Gen.* i. 421 (1791).
Trim. in Journ. Bot. xxvii. 165.
Fl. B. Ind. iv. 140. Rumph. Herb. Amb. ii. t. 75. Seemann, Fl. Viti. t. 34.

A small tree, young parts pubescent; l. 4–6 in., ovate, rounded or subcordate at base, acute, entire, glabrous on both sides, very finely reticulate, petiole 1–1½ in.; fl. on short ped., large, few, corymbs glabrous; cal. broadly tubular, about ½ in., glabrous outside, villous within, segm. irregular, shallow; cor. 1–1½ in. diam., tube funnel-shaped, much exceeding cal., lobes usually 6, rounded; stam. 6 exserted; fruit (not seen) 'completely enveloped in the enlarged persistent cal., about 1 in., nearly globular but contracted at top.'

Seacoast; very rare. As yet only found at Foul Point, Trincomalie Harbour, by Ferguson in 1885, and in all probability a recent importation by the waves or currents. Fl. Dec.; orange-yellow.

Found on shores of nearly all Tropical coasts and islands in the East, and often cultivated. Common in Andaman and Nicobar Is.

2. EHRETIA, *L.*

Shrubs or small trees, l. alt. or fascicled, fl. small, solitary or in corymbs; cal.-segm. 5; cor. rotate or subcampanulate, lobes 5, spreading, imbricate; stam. 5, inserted on cor.-tube; ov. 2-celled with 2 ovules in each cell, style single bifid or 2; fruit a drupe with 4 1-seeded pyrenes (sometimes combined into one 4-celled one); endosperm scanty.—Sp. 50; 10 in *Fl. B. Ind.*

Fl. in corymbs; style 1 . . . . . . 1. E. LÆVIS.
Fl. solitary; styles 2 . . . . . . 2. E. BUXIFOLIA.

1. **E. lævis,** *Roxb. Cor. Pl.* 42 (1798). **Addulá, Chirupulichchul,** *T.*
Moon Cat. 16. Thw. Enum. 214. C. P. 1879.
Fl. B. Ind. iv. 143. Wight, Ic. t. 1382. Bedd. Fl. Sylv. t. 246.

A shrub or very small tree, bark pale grey, young parts glabrous; l. 2–3½ in., oval or oblong- or obovate-oval, acute at base, subacute or obtuse or emarginate at apex, entire, glabrous, paler beneath, petiole ½–¾ in.; fl. numerous, on

short glabrous ped., in terminal (rarely axillary) spreading corymbs; cal. pubescent, segm. oblong-oval, subacute; cor. $\frac{1}{6}$ in. diam., lobes rounded, spreading; stam. spreading; style simple, shortly bifid; drupe $\frac{1}{8}$–$\frac{1}{6}$ in., tipped with style, nearly globose, bright scarlet, pyrenes 4, each with 1 seed.

Low country; in the dry region, very common; in the moist country, rare. Fl. April–August; white.

Throughout Tropical and Sub-tropical Asia, Polynesia, and Australia.

Our common plant seems referable to the var. *timorensis* of Fl. B. Ind.; a var. *canarensis* is also there given for Ceylon. There is much variety in the appearance of the inflorescence in different specimens, and in the moist region the l. are larger, attaining 5 in., and acuminate. *E. ovalifolia*, Wight, Ic. t. 1383, appears to be merely a slight variety with more obtuse leaves. It is given in Fl. B. Ind. iv. 143 as from Jaffna (Dyke).

2. **E. buxifolia,** *Roxb. Cor. Pl.* i. 42 (1795). **Hin-tambala,** *S.* **Pakkuvetti,** *T.*

Moon Cat. 16. Thw. Enum. 214. C. P. 1885.

Fl. B. Ind. iv. 144 (not given for Ceylon). Roxb. Cor. Pl. i. t. 57.

A bush, 3–4 ft. high, branches very numerous, slender, divaricate, bark reddish-brown, cracked; l. small, $\frac{1}{4}$–1 in., very numerous, sessile, fasciculate on suppressed branchlets, obovate-cuneate, acute at base, truncate with a few obtuse crenatures at apex, otherwise entire, slightly rough above with short bristly hairs (with a white spot round each when dry), shining and polished, paler beneath with conspicuous venation; fl. solitary or 2 together, on very short pubescent ped., axillary; cal. hairy, segm. oblong-spathulate, acute, leafy; cor. campanulate-rotate, $\frac{1}{4}$–$\frac{3}{8}$ in. diam., lobes ovate, subacute, spreading or recurved; stam. erect, exserted; styles 2, longer than stam., undivided; drupe small, $\frac{1}{4}$ in., globose, apiculate, shining, scarlet, pyrene 4-celled.

Dry and intermediate districts; common. Fl. Feb.–June; white.

Also in S. India, Malaya, Formosa, Philippines.

3. **COLDENIA,*** *L.*

An annual flattened herb, l. alt., sinuate-dentate, fl. small, axillary, solitary; sep. 4; cor. tubular, lobes 4, much shorter than tube; stam. 4, included in cor.-tube; ov. 2-celled, with 2 ovules in each cell, styles 2, short; fruit dry, strongly 4-lobed, with a sharp central double beak, hairy, muriculate, ultimately

---

* Commemorates Cadwallader Colden, M.D., who was Lieutenant-Governor of New York in 1761. He was a correspondent of Linnæus, and the first to introduce the Linnean system into America.

separating into one-celled beaked pyrenes.—Sp. 11; 1 in *Fl. B. Ind.*

C. procumbens, *L. Sp. Pl.* 125 (1753). **Chirupaddi,** *T.*
Herm. Mus. 13. Fl. Zeyl. n. 69. Moon Cat. 12. Thw. Enum. 215. C. P. 1890.
Fl. B. Ind. iv. 144. Pluk. Phytogr. t. 64, f. 6.

Annual, stems numerous, 3–12 in., prostrate, spreading, shaggy with hair, young parts silky, white; l. ½–1 in., on rather long slender petioles, tapering to base, rounded at apex, coarsely sinuate-dentate with few large teeth, very hairy on both sides except on the veins above; fl. nearly sessile; sep. oval, very hairy; cor.-lobes rounded, spreading.

Damp sandy ground, especially round tanks in the dry region. Fl. July, August; yellow.
Throughout the Tropics.

4. RHABDIA, *Mart.*

Shrubby, l. small, alt., crowded, fl. solitary, terminal; sep. 5, narrow, acuminate; cor. campanulate, lobes 5, deep, imbricate; stam. 5, inserted at base of cor.-tube; ov. 2-celled, with 2 ovules in each cell (apparently 4-celled), style long, simple, stigma bilobed; fruit small, containing 4 bony 1-seeded pyrenes; seed with scanty endosperm.—Monotypic.

R. lycioides, *Mart. Nov. Gen. & Sp.* ii. 137 (1826).
R. viminea, Thw. Enum. 214. C. P. 3491.
Fl. B. Ind. iv. 145. Hook. Ic. Pl. t. 823 (*R. viminea*). Wight, Ic. t. 1885 (*Ehretia cuneata*).

A shrub, branches virgate, with numerous short lateral suppressed branchlets, young parts pubescent; l. small, numerous, on very short petioles, crowded or fasciculate, about ½ in., linear-lanceolate, acute at base, obtuse at apex, slightly hairy and ciliate; fl. nearly sessile, solitary (rarely 2 or 3), terminating the lat. branchlets; sep. linear-lanceolate, acuminate, bristly-hairy; cor. ⅜ in. diam., tube very short, lobes oblong-oval, obtuse, spreading; fruit ovate-ovoid, shorter than persistent sep., tipped with style.

Moist low country; very rare. I have only seen the C. P. specimens collected in Ambagamuwa in 1855. Fl. Nov.; pink.
Also in Trop. Asia, Africa, and Brazil.

5. TOURNEFORTIA, *L.*

Trees or shrubs, l. alt., entire, fl. sessile, on scorpioid branches of terminal paniculate cymes; sep. 4 or 5; cor.

rotate or tubular, lobes 4 or 5, imbricate; stam. 4 or 5, inserted on tube or throat of cor.; ov. 4-celled with 1 ovule in each cell, style 0, stigma sessile, conical, bi-lobed; fruit containing 2 crustaceous pyrenes each 2-seeded; seeds with endosperm.—Sp. 100; 12 in *Fl. B. Ind.*

L. densely silky; cor. rotate, 5-lobed . . . 1. T. ARGENTEA.
L. glabrous; cor. tubular, 4-lobed . . . 2. T. WALKERÆ.

1. **T. argentea,** *L. f. Suppl. Pl.* 133 (1781). **Karan,** *S.*
Moon Cat. 13. Thw. Enum. 214. C. P. 1882.
Fl. B. Ind. iv. 145. Rumph. Herb. Amboin. iv. t. 55.

A small tree, 10–12 ft., trunk short, bark deeply furrowed, pale, branchlets thick, marked with scars of fallen l., twigs densely silky-pubescent; l. large, closely placed at end of branches, 4–8 in., oval or obovate-oval, much tapering to base, rounded or obtuse at apex, fleshy, densely covered with close silky white adpressed hair, petiole short, stout, obscure; fl. numerous, sessile, cymes peduncled, spreading, with long branches, silky, buds globose; sep. ovate-rotundate, imbricate, densely silky-hairy; cor. rotate; over $\frac{1}{4}$ in. diam., lobes rotundate, spreading; anth. sessile, large, at throat of cor., ov. glabrous; fruit size of a small pea (under $\frac{1}{4}$ in), depressed-globose, minutely apiculate, smooth, brown, pyrenes corky.

Sandy seashores; rare. At intervals along the South coast from Tangalle to Galle; Poduvai-katti-malai, N. of Trincomalie (Nevill). Fl. Dec., Jan.; white, faintly scented, anth. nearly black.

Also on the shores of the Nicobar Is., Malaya, Australia, and Mauritius; not in Peninsular India.

An extremely beautiful little tree, first collected here by Kœnig.

2. **T. Walkeræ,** *Clarke in Fl. B. Ind.* iv. 147 (1883).
T. Wallichii, Thw. Enum. 214 (? DC.). C. P. 2697.
Fl. B. Ind. iv. 147.

A straggling shrub, branches slender, slightly pubescent, l. $2\frac{1}{2}$–6 in., narrowly oblong-lanceolate, rounded or subcordate at base, much attenuate, subacute, glabrous, thin, venation conspicuous beneath, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. sessile, densely crowded, erect and secund or divaricate branches of pedunculate cymes; sep. 4, linear-lanceolate, cor. tubular $\frac{3}{8}$ in. long, very narrow, lobes 4, very short, spreading; stam. 4, inserted on base of cor.-tube, fil. longer than anth.; fruit about $\frac{1}{6}$ in., ovoid, smooth, yellowish.

Moist low country to 2000 ft. or higher; rare. Weligama; Pasdun Korale; Ambagamuwa; Hunasgiriya. Fl. Jan., Feb., and August; pale yellow.

Endemic.

I have followed Clarke in making this a distinct species; it is, perhaps, a variety of the Malayan *T. tetrandra*, Bl. The leaves dry black.

6. HELIOTROPIUM, *L.*

Annual or perennial herbs, l. alt., fl. small, in scorpioid terminal cymes, with or without bracts; cal.-segm. or sep. 5; cor. tubular, lobes 5, spreading, imbricate; stam. 5, included, anth. nearly sessile; ov. 4-celled, with 1 ovule in each cell, style short, stigma conical, not bifid; fruit dry, of 4 more or less distinct achenes, or 2-lobed with 4 one-seeded pyrenes.—Sp. 100; 16 in *Fl. B. Ind.*

Fruit quite enclosed in the cal. . . . . . 1. H. SUPINUM.
Fruit not enclosed in the cal.
  Fruit of 4 achenes.
    Erect; cymes very long . . . . . 2. H. PANICULATUM.
    Prostrate; cymes short . . . . . 3. H. SCABRUM.
  Fruit deeply two-lobed, containing 4 pyrenes . 4. H. INDICUM.

1. **H. supinum,** *L. Sp. Pl.* 130 (1753), var. **malabaricum,** *Retz. Obs.* iv. 24 (1781) (sp.).

Thw. Enum. 215. C. P. 2854.

Fl. B. Ind. iv. 149 (not given for Ceylon). Wight, Ic. t. 1387.

Annual, stems numerous, prostrate, 6–9 in., thickly clothed with long soft white hair, l. $\frac{1}{2}$–$\frac{3}{4}$ in., oval or rhomboid-oval, acute at base, subacute at apex, softly woolly on both sides, plicate, petiole slender, woolly; fl. subsessile, cymes simple, 1$\frac{1}{2}$–3 in., not peduncled; cal. ovate-ovoid, densely woolly-hairy, ultimately enclosing fruit, segm. short; cor. very small, slightly exceeding cal., tube long, wide below, narrowed above, lobes very short, triangular, inflexed; fruit enclosed in persistent cal., of 3 or 4 distinct achenes with flat sides and sharp edges.

Sandy seashores in the driest region; very rare. Delft Island (Gardner); Jaffna; Mannar. Fl. Feb.

Also in the dry districts of India; the type extends to West Asia and the Mediterranean.

[*H. zeylanicum*, Lam., is based on *H. curassavicum*, var. *β*, *zeylanicum*, Burm. Fl. Ind. 41, which was collected at Tuticorin, S. India, by Garcin. It is figured by Burman, Fl. Ind. t. 16, f. 2, which figure might well represent *H. paniculatum*. Wight refers it to his *Tournefortia zeylanica;* but from his plates (Ic. t. 892 and Ill. t. 170 B) that would seem to be quite a different plant. He is followed by the Fl. B. Ind. The specific name should, however, in that case be abandoned, as this latter plant does not occur in Ceylon.]

2. **H. paniculatum,** *Br. Prod.* 494 (1810).
H. linifolium, Lehm., Thw. Enum. 215. C. P. 1886.
Fl. B. Ind. iv. 151. Wight, Ic. t. 1391.

Semi-shrubby herb, stem 1–2 ft., erect, with numerous ascending branches, glabrous or with a few adpressed hairs, smaller branches compressed; l. sessile, soon falling, $\frac{1}{4}$–$\frac{1}{2}$ in., linear, glabrous above, with stiffly adpressed bristly hairs beneath, margin recurved; fl. very numerous, on short ped., cymes numerous, long, 3–4 in., stalked, spicate, simple or bifid, often with linear bracts; cal. slightly bristly, segm. cut nearly to base, ovate, acute; cor. tube much exceeding cal., narrowed at throat, limb funnel-shaped, lobes triangular, very acute; fruit of 4 very small, ovoid, slightly rough, brown achenes.

Sandy places near the coast in the dry district; rare. Near Mulliativu (Nevill); Jaffna (Gardner); Illupaikadavai, &c., N. Prov. Fl. Feb., July; white.

Also in S. India, Burma, Siam, Australia.

I suspect this may be really *H. zeylanicum*, Lam., in which case that name would take precedence of Brown's.

3. **H. scabrum,** *Retz. Obs. Bot.* ii. 8 (1781).
H. marifolium, Retz., Thw. Enum. 215. C. P. 1889, 1891.
Fl. B. Ind. iv. 152. Wight, Ic. t. 1389 and (*H. marifolium*) t. 1390.

Stems numerous, spreading, prostrate or ascending, much branched, strigose with long white hair; l. numerous, often crowded, shortly petiolate, $\frac{1}{4}$–$\frac{3}{4}$ in., lanceolate or linear-lanceolate, acute at both ends, with long bristly hairs on both sides; fl. on very short ped.; cymes usually very short and capitulate but sometimes shortly spicate, bracts numerous, leaf-like, hispid; cal.-segm. deep, ovate, acute, bristly; cor.-tube scarcely exceeding cal., lobes broad, acute or obtuse; fruit of 4 minute, ovoid, slightly scabrous achenes.

Damp sandy places in the low country, especially in the dry region; rather common. Fl. all the year; white.

Also in S. India.

I am unable to separate *H. marifolium*, Retz., from this, though it is maintained in Fl. B. Ind. Its inflorescence is less congested, being drawn out into spikes. The two names were published on the same page, but the one here adopted comes first. Nor does *H. bracteatum*, Br., given for Ceylon in Fl. B. Ind. iv. 152 (the specimens being, as I am informed by Dr. Stapf, C. P. 1891), seem to me to differ specifically, though, perhaps, worth varietal distinction from its different habit. To this is referred in Fl. B. Ind. *H. zeylanicum*, Wall. (non Lam.), as var. *laxiflora*. Dries black.

4. **H. indicum,** *L. Sp. Pl.* 130 (1753). **Ét-sétiya, Ét-honda, Dimi biya, Tédkodukku,** *T.*

Herm. Mus. 3. Fl. Zeyl. n. 70. Moon Cat. 12. *Heliophytum indicum*, DC., Thw. Enum. 215. C. P. 1893, 1894.

Fl. B. Ind. iv. 152. Wight Ill. t. 171 (*Tiaridium indicum*).

A coarse annual herb, 1–2 ft. high, stems stout, with ascending branches, hispid with long spreading hair; l. often sub-opposite, $1\frac{1}{2}$–3 in., ovate-oval or oval, rounded or narrowed below (often unequal-sided) and then suddenly contracted to decurrent base, obtuse or subacute at apex, entire but much undulate at margin, with few scattered bristly hairs above, minutely pilose beneath, with long hairs on the veins, rugose, veins prominent beneath, petiole $\frac{1}{2}$–1 in., winged; fl. numerous, sessile, in 2 rows, cymes very long, simple, stalked, with a stout bristly rachis; sep. linear, acute, with few long bristly hairs; cor.-tube much longer than sep. narrowed upwards, limb spreading, lobes very shallow, rounded; anth. sessile on base of cor.-tube; style very short; fruit deeply 2-lobed, each lobe compressed, bluntly 4-ribbed, produced above into a short blunt bidentate beak, and containing 2 angular beaked very hard 1-seeded pyrenes which have each a large empty cavity on the inner side.

Low country; very common, usually a roadside weed. Fl. April–July; pale violet.

Throughout the Tropics.

The leaves have a slightly fetid odour when bruised. The juice is used as an external application to local inflammations.

7. TRICHODESMA, *Br.*

Annual herbs, hispid, l. opp., sessile, passing into alt. bracts above, fl. large, cymes racemose with leafy bracts; cal. deeply cut into 5 segm., enlarged in fruit; cor. campanulate-rotate, tube very short, lobes 5, shallow, contorted; stam. 5, inserted in cor.-tube, fil. nearly absent, anth. large, connivent in a cone, exserted, pubescent or hairy, the ends much prolonged and spirally twisted; ov. 4-celled, depressed; fruit of a large central 4-winged membranous axis to which are adnate by their inner faces 4 ovoid 1-seeded achenes.—Sp. 10; 5 in *Fl. B. Ind.*

Cal. hispid, produced at base into long spurs . . 1. T. INDICUM.
Cal. silky, not produced at base . . . . . 2. T ZEYLANICUM.

1. **T. indicum,** *Br. Prod.* 496 (1810). **Kavil-tumpai,** *T.*
Fl. Zeyl. n. 71. *Borrago indica*, L. Sp. Pl. 137. Moon Cat. 13. Thw. Enum. 216. C. P. 1887.
Fl. B. Ind. iv. 153. Wight, Ill. t. 172.

Stem 6–12 in., erect, much branched, very hispid, l. numerous, 1–2 in., oblong-linear, subcordate or hastate at base, acute, hispid with harsh pustular hairs above, softly

pubescent beneath, upper ones smaller; ped. slender, hispid, nodding; cal. hispid, produced at back between the bases of segm. into 5 long acute spurs, segm. narrowly lanceolate, acute; cor. ½–¾ in. diam., lobes triangular, acute; cone of anth. large, very pointed, pubescent; fruit ovoid, achenes ⅙ in., ovoid, smooth and polished on back, cancellated on inner surface next the axis, nearly white.

A weed in cultivated and waste ground in the dry region; rather rare. Trincomalie (Glenie); Jaffna, abundant. Fl. Jan., Feb.; very pale violet-blue.

Also in India, Cabul, Persia, and in Mauritius.

There is no specimen in Hermann's Herb.

2. **T. zeylanicum,** *Br. Prod.* 496 (1810).

Burm. Thes. 48. *Borago zeylanica,* Burm. Fl. Ind. 41. Moon Cat. 13. Thw. Enum. 216. C. P. 1888.

Fl. B. Ind. iv. 154. Burm. Fl. Ind. t. 14, f. 2 (poor). Bot. Mag. t. 4820.

Stem 1–2 ft., erect, stout, with ascending branches in upper part, sparingly hispid with long hair; l. 2–4 in., narrowly lanceolate-oblong, acute at both ends, hispid with pustular hairs above, finely pubescent (with a few pustular hairs on veins) beneath; fl. numerous, ped. long, slender, with long spreading hair, nodding, opp. the large bracts; cal. softly hairy or silky, without spurs at base, segm. very deep, long, linear-lanceolate, very acute; cor. rather over ¾ in. diam.; fruit ovoid-rotund, achenes broadly ovoid, polished and dark grey on back, slightly irregular on inner surface.

Low country, and up to 4000 ft. by roadsides, but principally in the dry and intermediate region; common. Fl. Nov.-March; pale bright blue.

Also in India, Malaya, Australia, and Mascarene Islands.

8. CYNOGLOSSUM, *L.*

Perennial herb, l. alt., fl. rather small, in very long simple or bifid scorpioid cymes without bracts; cal.-segm. imbricate; cor. rotate, tube short, broad, the throat half closed by 5 bilobed scales, lobes 5, rounded, imbricate; stam. 5 very small, inserted in cor.-tube, included; style short, stout; fruit of 4 one-seeded achenes attached to a central axis, and covered with numerous glochidiate prickles.—Sp. 60; 10 in *Fl. B. Ind.*

C. micranthum, *Desf. Cat. Hort. Par.* 220 (1804). **Bu-katu-henda,** *S.*

C. ovatum, Moon Cat. 12. Thw. Enum. 215. C. P. 143.
Fl. B. Ind. iv. 156 (*C. furcatum*, var. *lanceolatum*).

Stem 3 ft. or more, erect, slender, stiff, with several long, ascending, arched branches above, hispid with copious short spreading hair ; lower l. on long hairy petioles, oval, 5–6 in. decurrent on petiole, acute, stem-l. subsessile, oval-lanceolate (the upper ones somewhat ovate), rather hispid above and on margins and venation beneath ; fl. rather distant, on drooping pubescent ped., cal.-segm. oval, subacute, hispid-pubescent ; cor. scarcely $\frac{1}{4}$ in. diam., lobes longer than tube, spreading ; achenes about $\frac{1}{8}$ in. rounded at base (outer end) somewhat concave on upper surface covered on all parts with glochidiate prickles, the uppermost (inner) row united at their base, the rest distinct.

Var. β, **decurrens,** *Moon Cat.* 12 (sp.). *C. furcatum*, Thw. Enum. 215 (? Wall.). Wight, Ic. t. 1395 (*C. furcatum*). C. P. 1892.

Stouter, more leafy, softly and densely pubescent, stem-l. sessile and decurrent for some distance on stem, softly pubescent on both sides, the uppermost ones not decurrent, cordate at base ; fl. on very short ped.; cor. twice as large, $\frac{3}{8}$–$\frac{1}{2}$ in. diam., achenes with a median ridge on upper surface, prickles all quite distinct.

Roadsides, waste ground, &c., up to 5000 ft.; very common. Var. β in upper montane zone, above 5000 ft., only. Fl. Feb.–Aug.; very pale greyish-blue, darker in centre. Var. β, bright blue.

Throughout India. Var. β in Himalaya and Nilgiri Mountains (?).

Var. β is perhaps a distinct species, but I am unable to fit our two plants to the descriptions given in Fl. B. Ind. Our common low-country weed seems to agree well with DC.'s description of *C. micranthum*, Desf. (which is probably *C. lanceolatum*, Forsk., and *C. racemosum*, Roxb.). Wallich's description of *C. furcatum* might cover both our forms, but best applies to the hill plant, as given by Wight and Thwaites. This, from its bright blue flowers, is called the 'Forget-me-not' by the English.

[*C. zeylanicum*, Thunb., is given by Lehmann as found on sandy shores in Ceylon. It is a S. Indian species, referred to *C. denticulatum*, A.DC., in Fl. B. Ind., and no specimens are known from here.]

XC.—CONVOLVULACEÆ.

HERBACEOUS, more rarely shrubs, generally twining or straggling, l. alt. (none in *Cuscuta*), without stip., fl. regular, bisexual, often large, bracteate, usually in axillary cymes; cal. persistent, free, segm. or distinct sep. 5, imbricate, often unequal; cor. campanulate, funnel-shaped or rotate, lobes 5, often faintly marked, plaited and contorted in bud; stam. 5, inserted in cor.-tube; ov. superior, 2-celled with 2 ovules in each cell, or 4-celled with 1 ovule in each (1-celled in *Erycibe*), style simple or bifid, stigmas 2 (1 in *Erycibe*); fruit dry or fleshy, indehiscent or opening by valves (rarely circularly at base); seeds 1–4, without endosperm, cotyledons plaited (in *Cuscuta* with endosperm and no cotyledons).

Not parasitic, with leaves.
  Fruit indehiscent, fleshy, or dry.
    Ov. 1-celled, stigma 1, sessile . . . . . 1. ERYCIBE.
    Ov. 4-celled, stigmas oblong . . . . . 2. RIVEA.
    Ov. 4-celled, stigmas globose . . . . . 3. ARGYREIA.
    Ov. 2-celled, stigmas globose . . . . . 4. LETTSOMIA.
  Fruit dehiscent, capsular.
    Style 1, simple.
      Stigmas globose . . . . 5. IPOMÆA.
      Stigmas ovoid . . . . 6. HEWITTIA.
    Style 1, bifid, stigmas globose . . . . . 9. BREWERIA.
    Styles 2, simple.
      Stigmas oblong; twining herb . . . . 7. CONVOLVULUS.
      Stigmas globose; small erect shrub . . . 10. CRESSA.
    Styles 2, bifid, stigmas linear . . . . . 8. EVOLVULUS.
Leafless parasites (*Cuscuteæ*) . . . . . . 11. CUSCUTA.

Plants of the low country, especially of the dry region. Of our 46 species, 6 only reach up to the hill-country, to which *Cuscuta reflexa* alone is confined. *Cressa* and 3 species of *Ipomæa* are seashore plants. Only 3 species are endemic—*Argyreia populifolia*, *Lettsomia hancorniæfolia*, and *Ipomæa jucunda*.

1. **ERICYBE,** *Roxb.*

A shrub, rambling or scandent, l. alt., entire, fl. moderate-sized, in racemes or panicles; sep. 5, small, imbricate, slightly enlarged in fruit; cor. campanulate with a short wide tube, lobes 5, imbricate, each deeply cut into 2 induplicate plaited segm., so as to appear 10-lobed; stam. 5, inserted at base

of cor.-tube ; anth. beaked ; ov. 1-celled, with 4 erect ovules, stigma large, sessile, circular spreading, slightly 5-lobed ; fruit a berry ; seed solitary, embryo with fleshy folded cotyledons, endosperm scanty.—Sp. 20 ; 11 in *Fl. B. Ind.*

E. paniculata, *Roxb. Cor. Pl.* ii. 31 (1798). **Éta-miriya, Étambiriya,** *S.*
Thw. Enum. 213. C. P. 1881.
Fl. B. Ind. iv. 180. Wight, Ill. t. 180.

A scandent shrub, branches long, flexuose, slightly angular, covered when young with brown tomentum ; l. $2\frac{1}{2}$–4 in., oval oblong-oval or lanceolate-oblong, acute at base, acuminate, subacute, apiculate, often twisted, entire, glabrous, thick, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. numerous, pedicellate, infl. axillary or terminal, usually shorter than l., densely covered with dark brown tomentum, buds globose ; sep. rotundate, obtuse, densely brown-tomentose, thick ; cor. about $\frac{5}{8}$ in. diam., the plaits brown-tomentose outside, lobes glabrous, their divisions obtuse, divaricate ; fil. very short ; ov. globose, glabrous ; berry ovoid, about $\frac{1}{2}$ in., supported on persistent sep., green, becoming black when dry.

Low country in the moist region ; rather common, extending into the intermediate region. Utuwankande (Moon) ; Hantane ; Galle ; Bentota ; Ratnapura ; Maturata ; Bintenne. Fl. Feb., March ; white, sweet-scented.

Also in India, Burma, Malaya, and Australia.

2. RIVEA, *Choisy.*

A straggling shrub, with silvery adpressed pubescence, l. cordate ; fl. large, solitary, axillary, bracts shorter than sep. ; sep. 5, rather unequal, imbricate, much enlarged in fruit ; cor. salver-shaped, tube long cylindric, limb nearly flat, plaited and twisted in bud ; stam. 5, inserted near top of tube, fil. slightly unequal ; ov. 4-celled with one ovule in each cell, style long, stigmas 2, oblong ; fruit dry but indehiscent ; seeds 1–4, immersed in mealy pulp, glabrous.—Sp. 2 ; both in *Fl. B. Ind.*

R. ornata, *Chois. Conv. Or.* 27 (1834). **Muchuḍḍai,** *T.*
Thw. Enum. 209. C. P. 1944.
Fl. B. Ind. iv. 183. Wight, Ic. t. 1356 (not good) ; Ill. t. 168 b, f. 1.

Stem climbing not twining, rather stout, cylindrical, finely silky-pubescent with white adpressed hairs ; l. $1\frac{1}{2}$–3 in., broadly ovate or reniform, cordate at base, very shortly acumi-

nate, apiculate, glabrous above, more or less densely white-silky beneath, petiole 1–2 in., densely silky; ped. articulated to stiff stout peduncle 1–3 in. long, bracts oblong, acute, fleshy, caducous, buds pointed, silky at tip; sep. about $\frac{3}{4}$ in., ovate, subacute, fleshy, silky-pubescent outside, cor.-tube $1\frac{1}{2}$–2 in., narrow, limb $2\frac{1}{2}$–$3\frac{1}{2}$ in. diam., lobes shallow, emarginate; ov. glabrous, stigmas blunt; fruit nearly globose, under 1 in., apiculate, smooth, shining, pale brown.

Climbing over rocks in the dry districts; rather rare. Trincomalie; Kirinde; Bibile; Nilgala; Mannar. Fl. Dec.–March; at first pure white, becoming pale cream-coloured, deliciously sweet-scented.

Also in S. India.

A beautiful plant. The flowers open at night; they become quite yellow when withered.

R. hypocrateriformis, Chois., is given in DC. Prod. ix. 326, for Trincomalie, but *R. ornata* may have been intended. It is, however, common in Western India, and should be looked for here; but the differences from *R. ornata* seem very slight.

3. **ARGYREIA,** *Lour.*

Semi-shrubby, stems stout, more or less twining, fl. large, bracteate, usually 3 or more in axillary cymes; sep. 5, nearly equal. much imbricate, either enlarged or unchanged in fruit; cor. funnel-shaped, limb scarcely lobed, stam. 5, not exserted; fil. often unequal; ov. 4-celled with one ovule in each cell, style long, stigmas 2, globose; fruit fleshy or dry, indehiscent, 1–4 seeded; cotyledons much crumpled, usually green.—Sp. 30; 25 in *Fl. B. Ind.*

Sep. much enlarged in fruit enclosing it . . 1. A. TILIÆFOLIA.
Sep. not enclosing fruit.
  L. silky silvery-white beneath . . . 2. A. SPLENDENS.
  L. nearly glabrous or hairy beneath.
    Sep. oval, obtuse.
      Peduncles over 3 in. . . . . 3. A. POPULIFOLIA.
      Peduncles under 3 in. . . . . 4. A. POMACEA.
    Sep. linear, acute . . . . . 5. A. CHOISYANA.

1. **A. tiliæfolia,** *Wight, Ic.* iv. pt. 2, 12 (1850). **Ma-banda,** *S.*
Ipomœa campanulata, Moon Cat. 14 (non L.). *Rivea tiliæfolia*, Chois., Thw. Enum. 209. C. P. 2848.

Fl. B. Ind. iv. 184. Wight, Ic. t. 1358.

Stems stout, very long, more or less pubescent, young parts tomentose; l. $2\frac{1}{2}$–5 in., ovate-rotundate, deeply cordate with rounded lobes at base, acute or apiculate, nearly glabrous above, densely but finely pubescent beneath, lat. veins numerous, petiole longer than l., stout, pubescent, prehensile;

fl. very large, on short stout pubescent ped., 3 in the cyme, peduncle much shorter than petiole, bracts very small, soon falling; sep. broadly oblong-oval or rotundate, truncate or very obtuse, very much imbricated, pubescent, greatly enlarged and thickened in fruit; cor.-tube $1\frac{1}{2}$ in. long, funnel-shaped, wide, limb 3 in. diam., plaits glabrous outside; capsule completely enclosed in the much-enlarged sep. (the whole forming a globose apple-like fruit nearly $1\frac{1}{2}$ in. diam.) depressed-globose, $\frac{3}{4}$ in., pericarp dry, very thin; seeds 4, subglobose, pubescent, pale brown.

Moist low country, very common. Fl. Oct.; pale mauve-pink, occasionally white.

Throughout India, Malaya, and the Philippines.

A coarse rank plant, though the flowers are beautiful.

A. speciosa, Sweet, C. P. 2849, *Maha-dumudu*, S., is much cultivated near the coast for the sake of its large handsome leaves, snowy-white beneath, and beautiful large purple flowers. It is considered native in Bengal.

2. **A. splendens,** *Sweet, Hort. Brit. ed.* 2, 373 (1830).
Thw. Enum. 210. C. P. 2845.
Fl. B. Ind. iv. 186 (not given for Ceylon). Bot. Mag. t. 2628 (*Ipomœa splendens*).

Stems long, cylindrical, adpressed silky, l. large, 6–9 in. ovate, rounded at base, acuminate, acute, glabrous above, densely silky and silvery-white beneath, petiole 3–4 in., silky; fl. moderate-sized, on short ped., 3 or more in cyme, bracts small, caducous, peduncle longer than petiole; sep. small, not enlarged in fruit, oval, obtuse, densely tomentose, silky outside; cor.-tube about 1 in., limb about 1 in. diam., plaits hairy outside; fruit not seen ('scarlet').

Moist region, very rare. I have only seen Gardner's specimens labelled Hantane, but possibly cultivated. Fl. pink.

Also in Khasia and Burma.

3. **A. populifolia,** *Chois. in DC. Prod.* ix. (1845). **Giri-tilla,** *S.*
Ipomœa zeylanica, Gaertn. Fruct. ii. 482; Moon Cat. 14. *Rivea zeylanica*, Thw. Enum. 209. C. P. 1943.
Fl. B. Ind. iv. 187. Gaertn. Fruct. t. 178, f. 1.

Stems very long, stout, twining, nearly glabrous or slightly rough with hair; l. 3–5 in., ovate, usually cordate at base, acuminate, acute, minutely puberulous on both sides, veins prominent beneath, petiole near length of l., stout, thickened at base, adpressed-pubescent, with 2 wart-like glands at summit or at base of midrib; fl. sessile, cymes with very short dichotomous branches, capitulate, bracts large, leafy, unequal, lanceolate-oblong, obtuse, slightly hairy, peduncles very long, 6–8 in., curved; sep. oval, obtuse, silky-

pubescent, scarcely enlarged in fruit; cor.-tube over 1 in. long, limb about 1½ in. diam., hairy on plaits outside; fil. hairy at base; fruit globose, somewhat depressed, smooth, fleshy, yellow.

Var. β, **coacta,** *Clarke in Fl. B. Ind.* iv. 189 (sub *A. hirsuta*). *Rivea zeylanica*, var. β, *hirsuta*, Thw. Enum. 209. C. P. 1944.

Stems more hairy, l. silky-hairy on both sides, bracts longer and narrower.

Low country and hills up to 5000 ft., very common, var. β somewhat less so. Fl. May, June; pale violet-pink, shading into red-purple in the tube.

Endemic.

One of the most abundant plants everywhere within its range, and not variable. The flowers are occasionally white. Has a bitter milky juice.

Var. β should perhaps be considered a distinct species. It is near *Rivea hirsuta*, Wight, Ic. t. 891, to which Thwaites and Clarke refer it.* The Fl. B. Ind. has a var. *Thwaitesii* with narrower leaves and bracts.

4. **A. pomacea,** *Chois. in DC. Prod.* ix. 329 (1845), var. **triflora,** *Clarke in Fl. B. Ind.* iv. 188.

A. Leschenaultii, Thw. Enum. 210 (non Chois.). C. P. 1932.

Fl. B. Ind. iv. 188.

Stems long, woody below, slightly rough with adpressed hair; l. 2–3 in., ovate or ovate-lanceolate, more or less rounded at base, acute, nearly glabrous above, more or less strongly hairy beneath, petiole shorter than l.; fl. on very short ped., 3 or more in cyme, peduncle 1–3 in., bracts numerous, oblong, obtuse or apiculate, hairy, persistent; sep. ovate, obtuse, slightly hairy, not much enlarged in fruit; cor.-tube about 1 in., very hairy outside, limb about ¾ in. diam.; fruit depressed-globose, ⅔ in., smooth, yellow.

Dry region, rare. Batticaloa (Gardner); Trincomalie. Fl. August; pink.

The type in S. India, our variety endemic.

I do not well know this plant, which seems to be maritime with us, and may possibly be a coast variety of *A. populifolia*. The typical *A. pomacea* is figured in Wight, Ic. t. 888, and is a very hairy plant.

5. **A. Choisyana,** *Wight, ex Fl. B. Ind.* iv. 190 (1883).

Batatas Choisyana, Wight, Thw. Enum. 210. C. P. 3647.

Fl. B. Ind. iv. 190 (not given for Ceylon). Wight, Ic. t. 491 (*Batatas*).

Stem hairy with spreading hair; l. small, very hairy on both sides, oval-oblong, apiculate; bracts linear-lanceolate, acute, hairy; sep. linear, hairy; cor.-tube about 1 in., glabrous; fruit not seen.

Dry region; very rare. I have seen only the single poor specimen with two leaves and one flower, which represents C. P. 3647. It is labelled, 'Batticaloa, March, 1858.'

Also near Madras, S. India.

---

* The figure of *A. hirsuta* in Bot. Mag. t. 4940 has much larger flowers.

4. **LETTSOMIA,** *Roxb.*

Climbing scarcely twining shrubs, fl. large or small, bracteate, in axillary cymes or solitary; sep. 5, 2 much broader than others, strongly imbricate, somewhat enlarged and thickened in fruit; cor. funnel-shaped, more or less 5-lobed; stam. 5, exserted or included; ov. surrounded by annular disk, 2-celled, with two ovules in each cell, style simple, stigmas 2, globose; fruit fleshy, indehiscent, 1–4-seeded.—Sp. 32; 21 in *Fl. B. Ind.*

Fl. ½ in. long; stam. exserted . . . 1. L. AGGREGATA.
Fl. 1 in. or more long; stam. included.
  L. oblong, hairy; fruit ½ in. . . . 2. L. ELLIPTICA.
  L. oval, glabrous; fruit 1 in. . . . 3. L. HANCORNIÆFOLIA.

1. **L. aggregata,** *Roxb. Hort. Beng.* 13 (1814), var. **osyrensis,** *Clarke*, *l. c.* 192.
Argyreia aggregata, Chois., Thw. Enum. 210. C. P. 1945.
Fl. B. Ind. iv. 191. Wight, Ic. t. 1359.

A large shrubby climber, branches very long, densely white-tomentose; l. 3–5 in., ovate, shallowly cordate at base, obtuse, apiculate, shortly hairy above, densely tomentose and white or yellowish-white beneath, lat. veins prominent, petiole 1½–3 in., stout, cylindrical, tomentose; fl. small, sessile in threes, crowded in roundish capitate cymes, bracts large, broad, truncate, silky-tomentose outside; sep. oblong, obtuse, densely silky-hairy outside; cor. about ½ in. long, funnel-shaped, tube glabrous outside, lobes oval, erect, emarginate, very hairy outside; stam. much exserted; style shorter than stam.; fruit small, ¼–⅓ in., globose, smooth, red, surrounded by the enlarged spreading, rather thick concave sep. which are hairy without, glabrous and smooth within; seeds smooth, grey.

In open places in the dry region; very common. Fl. Feb.–May; flesh-pink.
Also in S. India and Burma.

2. **L. elliptica,** *Wight, Ic.* iv. pt. 2, 12 (1850).
Argyreia elliptica, Chois., Thw. Enum. 210. C. P. 1933.
Fl. B. Ind. iv. 192.

Stems slender, nearly glabrous, woody below; l. numerous, closely placed on numerous short branchlets, 2–3 in., lanceolate-oblong, rounded at base, acute, sparsely hairy on both sides, lat. veins numerous, very oblique, petiole slender ¾–1 in.; fl. rather large, on short ped., 3 in the cyme, bracts caducous, peduncle usually shorter than l.; sep. ovate, sub-

acute, pubescent; cor.-tube 1¼ in., glabrous, limb 2 in. diam. scarcely lobed; stam. included; fruit ⅓ in., nearly globose, yellow, surrounded by slightly enlarged spreading sep.

Moist and intermediate country up to 4000 ft.; common. Fl. Nov.; pale mauve, purple in the tube.
Also in S. India.

[*L. setosa*, Roxb., is given for Ceylon in Fl. B. Ind. iv. 194, but I do not know on what authority. There is no specimen from here in Herb. Kew.]

3. **L. hancorniæfolia,** *Clarke in Fl. B. Ind.* iv. 196 (1883).
Argyreia hancorniæfolia, Gardn., Thw. Enum. 210. C. P. 1924.
Fl. B. Ind. iv. 196.

Stems semi-scandent, when young adpressed-pubescent with fulvous hair; l. numerous, 2½–3½ in., broadly oval, obtuse at base, acuminate, acute, glabrous, rather coriaceous, lat. veins very numerous, close and parallel, petiole ¾–1½ in., slender, pubescent; fl. rather large, solitary axillary, ped. shorter than petiole, bracts small, deciduous; sep. ovate, obtuse, fulvous-pubescent, cor.-tube about 1 in., limb about 1½ in. diam., lobes rounded emarginate; fruit large, over 1 in., oblong-ovoid, pointed, supported on enlarged spreading sep., 1-seeded.

Lower montane zone; very rare. I have only seen it at Hantane, but Thw. gives 'Central Province up to 5000 ft.,' as though he had met with it elsewhere. Fl. rose-pink.
Endemic.

5. IPOMÆA, *L.*

Annual or perennial, stems usually twining, often prostrate, rarely creeping; l. alt., usually entire, fl. in axillary cymes (often reduced to a single fl.), usually large, rarely small; sep. 5, equal or unequal, very much imbricate, often enlarged in fruit; cor. funnel-shaped, campanulate or salver-shaped, 5-lobed, lobes usually inconspicuous; stam. 5, fil. usually unequal; ov. 2-celled (rarely 3- or 4-celled), with 2 ovules in each cell, style simple, stigmas 2, globose; fruit a dry globose or ovoid capsule, usually 4-valved; seeds 1–4, glabrous or hairy.—Sp. about 300; 57 in *Fl. B. Ind.*

Ov. 4-celled, l. palmately lobed (*Batatas*) . . . 1. I. DIGITATA.
Ov. 3-celled, l. palmately lobed (*Pharbitis*).
  Twining; fl. 2 in. diam. . . . . . . 2. I. HEDERACEA.
  Not twining; fl. under ½ in. diam. . . . . 3. I. DISSECTA.

Ov. 2-celled.
- Cor.-tube over 2 in.; fil. long, equal (*Calonyction*).
  - Seeds glabrous . . . . 4. I. BONA-NOX.
  - Seeds hairy.
    - Hair short, velvety, with a fringe of long hair 5. I. GRANDIFLORA.
    - Hair all very long, silky . . . . . 6. I. JUCUNDA.
- Cor.-tube under 2 in.; fil. short, usually unequal.
  - Seeds with a marginal ring of scaly hair; fl. solitary (*Aniseia*) . . . . . . 7. I. UNIFLORA.
  - Seeds glabrous or hairy, fl. in cymes (often reduced to 1).
    - Cymes capitulate with persistent bracts.
      - Peduncle long.
        - L. cordate-ovate (slightly lobed in 9).
          - Outer bracts very large, connate . 8. I. PILEATA.
          - Outer bracts not connate.
            - L. white beneath . . . . . 9. I. WIGHTII.
            - L. not white . . . . . . 10. I. BRACTEATA.
        - L. palmately 5–9-fid . . . . . 11. I. PES-TIGRIDIS.
      - Peduncle very short . . . . . . 12. I. ERIOCARPA.
    - Cymes not capitulate, bracts usually deciduous.
      - L. simple.
        - L. more or less cordate, usually entire.
          - Fl. yellow.
            - Not twining; seeds glabrous.
              - L. linear, hastate at base . . 13. I. ANGUSTIFOLIA.
              - L. obovate-oblong with toothed auricles . . . . . 14. I. TRIDENTATA.
              - L. reniform . . . . . . 15. I. RENIFORMIS.
            - Twining, seeds pubescent . . 16. I. CHRYSEIDES.
          - Fl. white or purple, or both.
            - Seeds hairy or pubescent.
              - Twining.
                - Cymes many-flowered.
                  - Fl. 1 in. diam. . . . . 17. I. STAPHYLINA.
                  - Fl. 2 in. diam . . . . 18. I. CYMOSA.
                - Cymes few-flowered.
                  - Fl. 1½ in. diam.
                    - Fl. 4–8 in cyme . . 19. I. SEPIARIA.
                    - Fl. 2 in cyme or solitary . 20. I. OBSCURA.
                  - Fl. 3½ in. diam. . . . 21. I. CAMPANULATA.
              - Not twining . . . . . 22. I. AQUATICA.
            - Seeds glabrous.
              - Not twining . . . . . 23. I. REPENS.
              - Twining; fl. white . . . 24. I. DENTICULATA.
              - Twining; fl. purple . . . 25. I. TURPETHUM.
        - L. deeply bilobed; fl. purple . . 26. I. BILOBA.
        - L. palmately 5 or 7-lobed; fl. yellow . 27. I. VITIFOLIA.
      - L. compound or very nearly so.
        - L. palmate, with 5 lflts. . . . . 28. I. PALMATA.
        - L. deeply pinnatisect, basal segm. pedate . . . . 29. I. DASYSPERMA.

1. ***I. digitata,** *L. Syst. Nat. ed.* 10, 924 (1759). **Kiribadu,** *S.*
Batatas paniculata, Choisy, Thw. Enum. 210. C. P. 499.
Fl. B. Ind. iv. 202. Bot. Reg. t. 62 (*I. paniculata*).

Perennial, with very large ovoid or elongated tuberous roots; stems long, twining, tough, glabrous and shining, rather glaucous; l. large, 4–6 in., broader than long, deeply palmately cut into 5 or 7 lanceolate, acuminate, obtuse lobes, glabrous, paler and with prominent veins beneath, petiole nearly as long as l., glabrous, channelled above; fl. very large, on glabrous ped., numerous, cymes corymbose, dichotomous, peduncle long, exceeding petiole, stout; sep. under $\frac{1}{3}$ in., rotundate, obtuse, very concave, glabrous; cor. funnel-shaped, limb $2\frac{1}{2}$–3 in. diam., lobes obvious, emarginate; ov. 4-celled, glabrous; capsule $\frac{1}{2}$ in., closely surrounded by enlarged rather fleshy sep., ovoid; seeds covered with very long brownish cottony hair which is readily detached.

Low country; rather common, but generally near gardens or houses. Much planted, and doubtfully native here. Fl. April, May; bright mauve-purple, darker in the tube.

Throughout the Tropics.

The juice of the root is much used as a medicine for increasing the flow of milk and other secretions.

I. cissoides, Griseb., is an abundant weed in Peradeniya Gardens and as an escape in the neighbourhood. It is C. P. 1941, and a native of S. America and W. Indies.

I. Batatas, Lam., *Batala*, S., is the Sweet Potato, largely cultivated, and often found about deserted gardens. It is a native probably of America, but is not known wild. There are several varieties grown here.

2. ***I. hederacea,** *Jacq. Collect.* i. 124 (1786). **Tali,** *T.*
Pharbitis Nil, Chois., Thw. Enum. 210. C. P. 1938.
Fl. B. Ind. iv. 199. Bot. Mag. t. 188 (*Convolvulus Nil*). Bot. Reg. t. 276 (*I. cærulea*). Bentl. and Trim. Med. Pl. t. 185 (*I. Nil*).

Annual, stems twining, slender, hirsute with deflexed hair; l. 2–3 in., usually broader than long, cordate at base, palmately 3-lobed, lobes deep, acute, middle one the largest, slightly hairy on both sides, especially on veins beneath, petiole a little shorter than l.; fl. large, on short stout ped., usually solitary but often in threes, bracts linear, persistent, peduncle shorter than petiole; sep. equal, long, $\frac{3}{4}$ in., linear, dilated below, acute, hairy; cor. tubular-funnel-shaped, limb 2 in. diam., ov. 3-celled; capsule $\frac{1}{2}$ in., surrounded by the much longer enlarged sep., globose, 3-valved; seeds usually 6, $\frac{1}{4}$ in., ovoid-triangular, glabrous, dull, black.

Low country, commonly cultivated but doubtfully wild, unless perhaps, in the dry region. Fl. Jan.–March; bright pale blue or pink.

Found throughout the Tropics, but probably originally American.

The flowers are often of the most intensely brilliant deep azure blue. The strongly purgative seeds are an official drug in the Indian Pharmacopœia, under the name of Kaladana.

[*I. Learii*, Paxt., a now well-known garden plant, was first made known to English florists by plants raised in Knight's Nursery in 1839 from seeds sent from Ceylon by J. G. Lear. It is not, however, a Ceylon species, but probably from temperate S. America (see Bot. Reg. 1841, t. 56 and Bot. Mag. t. 3928).]

3. **I. dissecta,** *Willd. Phytog.* 5 (1794).
I. coptica, Roth., Thw. Enum. 212. C. P. 1928.
Fl. B. Ind. iv. 200.

Annual, with a very short central stem and numerous prostrate, slender wiry branches, 6–18 in. long, not twining; l. of the main stem 1½–2 in., oblong-lanceolate, tapering to base, acute, irregularly serrate, of the branches under 1 in., very deeply 3-fid, the lat. segm. usually again pedately divided, and the whole deeply irregularly and very acutely serrate, petiole much shorter than l.; fl. usually solitary, small, on very short ped., bracts close beneath fl., large, pectinate (like the upper l.), peduncle longer than petiole; sep. lanceolate, acuminate, glabrous but rough with prominences, apex cuspidate, recurved; cor. less than ½ in. diam., ov. 3-celled; capsule ovoid-globose, ⅙ in., 3- or 6-valved, glabrous; seeds usually 3, pubescent.

Sandy places, especially on the coast in the dry region; rather rare. Trincomalie (Glenie); Jaffna; Mannar. Fl. Jan.–March; creamy-white.
Also in S. India, Trop. Africa, and Australia.

4. ***I. Bona-nox,** *L. Sp. Pl.* 2, 228 (1762). **Alanga, Kalu-alanga,** *S.*
Convolvulus grandiflorus, Moon Cat. 13. *Calonyction speciosum*, Chois., Thw. Enum. 211. C. P. 3648.
Fl. B. Ind. iv. 197 (var. *grandiflora*). Wight, Ic. t. 1361. Bot. Mag. t. 752.

Stems very long, twining, quite glabrous; l. large 4–7 in., broadly ovate, deep cordate with broad rounded lobes at base, acuminate, acute, entire, glabrous, thin, petiole nearly as long as l., cylindrical, glabrous, with 2 wart-like glandular swellings at the summit (very conspicuous when young); fl. very large, solitary or few, on short stout succulent ped., peduncle about as long as petiole, stout, glabrous; sep. nearly equal in length, about ½ in., glabrous, inner 2 very broad, outer 3 strongly mucronate; cor.-tube 3–3½ in., narrow, cylindrical, limb 4–5 in. diam.; stam. somewhat exserted; capsule ovoid-oblong, about 1 in., narrowed upward; seeds glabrous.

Low country; common, but chiefly near houses and gardens. Fl. Jan.–April; white.

In most Tropical countries, but probably originally American.

It is very doubtful if this beautiful plant be truly native here. I do not trace it in the old books, and even Moon (Cat. 14), who gives both *I. Bona-nox* and *I. grandiflora*, considers them foreigners; but he gives his *C. grandiflorus* for 'Kandy' as native. It is known as 'Moonflower' by the English; the great white blossoms expand in the evening, and wither an hour or two after sunrise. I do not know in what way *I. grandiflora*, Roxb. (non Lam.) differs from *I. Bona-nox*, L., which was, however, only known to Linnæus from American specimens.

I. muricata, Jacq., is cultivated in native gardens in the dry districts for the sake of its swollen fleshy pedicels, which are eaten (C. P. 3580). It is said to be a native of Northern India and Japan, and is well figured in Bot. Reg. iv. t. 290.

5. **I. grandiflora,** *Lam. Ill. Gen.* i. 467 (1791) (non Roxb.).
Calonyction comospermum, Boj., Thw. Enum. 211. C. P. 3536.
Fl. B. Ind. iv. 198 (in part). Rheede, Hort. Malab. ix. t. 50.

Stems long, cylindrical, glabrous; l. 3–6 in., rotundate-ovate, deeply cordate at base, suddenly acuminate, acute or cuspidate, glabrous, petiole nearly as long as l., with 2 glands at apex; fl. very large, on much-swollen glabrous ped., usually solitary rarely 2–4, bracts small, soon falling, peduncle as long as petiole, stout; sep. about 1 in., ovate, obtuse, mucronate, glabrous; cor.-tube about 3 in., limb $3\frac{1}{2}$ in. diam.; fil. about 2 in., not exserted; capsule surrounded by much-enlarged sep. equalling it in length, globose, nearly 1 in., apiculate; seeds $\frac{3}{8}$ in., ovoid, densely covered with a short brown velvety tomentum, and with a marginal fringe of long pale brown hair.

Near the seacoast; rare. Jaffna (Gardner); Dikwelle, S. Prov. (Thwaites); Trincomalie. Fl. Aug., Sept.; white.

On most Tropical shores of the Old World.

Always (?) maritime. Differs from *I. Bona-nox* chiefly by its seeds. Hermann seems to have collected it (Mus. 52), but there are no specimens of his existing. Thw. suggests that the *Rivea hypocrateriformis* recorded by Choisy from Trincomalie may have been this.

6. **I. jucunda,** *Thw. Enum.* 211 (1860). [PLATE LXVI.]
Thw. Enum. 426. Trim. Syst. Cat. 59. C. P. 3448.
Fl. B. Ind. iv. 198 (under *I. grandiflora*).

A very large twiner, stems rough with blunt prominences, glabrous, young parts slightly pubescent; l. 3–5 in., ovate, cordate with rounded lobes at base, caudate-acuminate, very acute, nearly glabrous above, pubescent and somewhat glandular beneath, petiole nearly as long as l., pubescent; sep. $1-1\frac{1}{4}$ in., equal, ovate-oblong, obtuse, mucronate, pubescent, with a few glandular pits at base; cor.-tube $2-2\frac{1}{2}$ in., limb over 4 in. diam., stam. not exserted, fil. about 1 in., capsule sur-

rounded by enlarged spreading sep., 1 in., ovoid, truncate; seeds nearly ½ in., compressed, black, entirely covered with copious brownish-grey hair ¾ in. long.

Moist region; very rare. Only found in Dolosbagie District. Fl. April, May; white, night-flowering.

Endemic.

This is combined with *I. grandiflora* in Fl. B. Ind., but seems well defined.

I. coccinea, L., and *I. Quamoclit*, L., both Tropical American, have long been naturalised, the latter especially, which was collected by Hermann, and is Fl. Zeyl. n. 77. Moon gives for this the name 'Ratapamba.'

7. **I. uniflora,** *Roem. & Sch. Syst.* iv. 247 (1819). **Potupala,** *S.*
Aniseia uniflora, Chois., Thw. Enum. 212. *Convolvulus marginatus.* Moon Cat. 13. C. P. 3006.
Fl. B. Ind. iv. 201. Wight, Ic. t. 850.

Stems slender, glabrous or slightly silky-pubescent, twining; l. 2–3 in., lanceolate-oblong, acute at base, obtuse or emarginate, mucronate at apex, entire, glabrous above, slightly hairy beneath, petiole ¼–½ in.; fl. solitary, on angular or slightly winged pubescent ped., bracts small, peduncle 1–1½ in.; sep. about ¾ in., nearly equal in length, apiculate, pubescent, the two outer enclosing the rest, oval, either cordate or decurrent at base, the two innermost linear; cor. campanulate, limb 1¼ in. diam., recurved; capsule ⅔ in., ovoid, glabrous, 4-valved; seeds ovoid, dark brown, slightly pubescent, fringed with a ring of short scaly hairs round margin.

Moist low country; rather rare. Galle; Kalutara; Pasdun Korale. Fl. Dec.; white.

Also in India, Malaya, Fiji Is., Trop. Africa.

8. **I. pileata,** *Roxb. Fl. Ind. ed. Carey & Wall.* ii. 94 (1824).
Thw. Enum. 212. C. P. 3501.
Fl. B. Ind. iv. 203. Wight, Ic. t. 1363.

Annual, stem long, twining, much branched, deflexed-hairy; l. 1–2½ in., broadly cordate-ovate, acuminate, obtuse, apiculate, entire, hairy on both sides, petiole longer or shorter than l., deflexed-hairy; fl. rather small, sessile, 3 or more in a head, bracts as long as sep., obovate, hairy, head surrounded and half concealed by a large deep boat-shaped cup (formed of 2 connate outer bracts) about 1½ in. long, produced at either end and there blunt and everted, veiny, sparsely hairy outside, peduncle longer or shorter than petiole; sep. ⅜ in., shaggy with long hair, outer oblong-oval obtuse, inner linear; cor. salver-shaped, tube ¾ in., narrow, cylindrical, limb flat, over 1 in. diam.; capsule obovate-ovoid, somewhat depressed,

4- or 8-valved, seeds dark brown, glabrous, with a fringe of short white hair at margin.

Low country; rare. Dambulla; Peradeniya. Fl. Nov.–March; bright pink.

Also in India.

A very distinct species from its curious inflorescence. The flowers open punctually at 5 p.m.

9. **I. Wightii,** *Chois. Conv. Or.* 88 (1833).
Thw. Enum. 212. C. P. 2851.
Fl. B. Ind. iv. 203. Wight, Ic. t. 1364 (fl. much too small).

Stem twining, rather stout, hispid with spreading yellow hairs; l. 3–4 in., cordate-ovate with shallow basal lobes, acute, mucronate, margin undulate or irregularly crenate, hairy above, finely tomentose and snowy white beneath, petiole 1–2 in., bristly; fl. sessile, 3–6 in a dense head, bracts narrow very bristly, outer bracts lanceolate, acuminate, peduncle longer than petiole, very hairy; sep. nearly equal, lanceolate-linear, attenuate, with yellow bristly hair; cor. widely funnel-shaped, hairy outside, limb about 1 in. diam.; ov. with long erect bristles on top; capsule $\frac{3}{8}$ in., subglobose, hairy; seeds finely worted, minutely puberulous.

Moist region, 2000–4000 ft.; rather rare. Hantane; Ramboda; Atampitiya. Fl. Jan., Feb.; pink.

Also in Southern India.

10. **I. bracteata,** *Wight, Ic.* iv. pt. 2, 14 (1850).
Trim. in. Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 203. Wight, Ic. t. 1374.

Stem slender, twining, with long spreading hair; l. small $1-1\frac{1}{2}$ in., broadly cordate-ovate, acute, entire, hairy on both sides, petiole longer than l., hairy; fl. small, sessile, usually 3 in a head, bracts large, ovate, acute, hairy, outer bracts larger, similar in form, peduncle as long as or longer than petiole, hairy; sep. equal, lanceolate, acuminate, hairy, cor. funnel-shaped, limb under $\frac{1}{2}$ in. diam.; capsule not seen.

Moist low country; very rare (?). As a weed on Culloden Estate near Kalutara in 1880 (Ferguson). Fl. March; 'purple-pink.'

Also in S. India, whence it may have been introduced.

I have very scanty material for this.

11. **I. Pes-tigridis,*** *L. Sp. Pl.* 162 (1753). **Divi-adiya, Divi-pahuru,** *S.*

Herm. Hort. Acad. Lugd.-Bat. 184; Mus. 12. Burm. Thes. 70. Fl. Zeyl. n. 78. Moon Cat. 14. Thw. Enum. 212. C. P. 1942.

Fl. B. Ind. iv. 204. Herm. Hort. Acad. Lugd.-Bat. t. 187. Wight, Ic. t. 836.

---

* A translation of the S. name; from the form of the leaf, thought to resemble a tiger's foot.

Annual, stems straggling or twining, with long spreading hair; l. 1½–3 in., rotundate in outline, more or less deeply palmately cut into 5, 7, or 9 ovate acute lobes narrowed at base, hairy on both sides, petiole 1½–2½ in., with long hair; fl. sessile, 3 or more in a head, bracts oblong-oval, obtuse, hairy, outer ones larger, peduncle longer than petiole, stout, very hairy, sep. nearly equal, lanceolate, very acuminate, with copious long hair; cor. rather small, tubular-campanulate, limb under 1 in. diam.; capsule under ¼ in., concealed in cal., globose, seeds pubescent.

Var. β, **hepaticifolia,** *Clarke, l. c.* Herm. Mus. 65. Burm. Thes. 73. Fl. Zeyl. n. 79. *I. hepaticifolia*, L. Sp. Pl. 161. Burm. Fl. Ind. t. 20, f. 2 (bad).

L. only 3-lobed and often very shallowly so.

Low country; common in dry sandy places. Fl. Oct.; pale pink or white.

Throughout Tropical Asia and Africa.

Var. β is scarcely deserving of separation, since 3-lobed or even entire l. may be found on the same plant as the ordinary 7-lobed ones.

12. **I. eriocarpa,** *Br. Prodr.* 484 (1810).
I. sessiliflora, Roth., Thw. Enum. 212. C. P. 3107.
Fl. B. Ind. iv. 204. Wight, Ic. t. 169 (*I. sessiliflora*).

Stems slender, twining, hairy; l. 2–4½ in., linear- or oblong-lanceolate, somewhat dilated and deeply cordate at base, tapering, apiculate, sparingly hairy on veins above and beneath and on margin, petiole ¾–1¼ in., with deflexed hair; fl. rather small, on very short ped., three (rarely more) in a head, bracts small, linear, no outer ones, peduncle very short, under ¼ in.; sep. oblong-linear, dilated at base, very hairy; cor. campanulate, scarcely exceeding sep., under ½ in. diam., lobes with a small tuft of hair at apex; ov. very hairy; capsule ⅓ in., globose, hairy; seeds minutely dotted, glabrous.

Moist region to 4000 ft.; rather rare. Uva Province; Wattegoda. Fl. Feb.–April; pink.

Throughout Tropics of Old World.

13. **I. angustifolia,** *Jacq Ic. Rar.* ii. t. 317 (1786). **Hin-madu,** *S.*
Convolvulus Medium, Moon Cat. 13 (? Linn). *I. tridentata*, var. β, Thw. Enum. 211. C. P. 1930.
Fl. B. Ind. iv. 205. Bot. Mag. t. 5426 (*I. filicaulis*). Rheede, Hort. Malab. xi. t. 55.

Annual or biennial, stems very long, not twining, prostrate, not rooting at nodes, 5-angled, glabrous, wiry, slightly branched; l. very numerous, 2–2½ in., on very short petioles, linear or narrowly lanceolate-oblong, dilated with coarsely dentate auricles at base, otherwise entire, cuspidate at apex;

fl. solitary or 2, on thick glabrous ped., peduncle about as long as l., slender, stiff, divaricate; sep. lanceolate, acuminate, acute, glabrous, points recurved; cor. funnel-shaped, about 1 in. diam., shallowly lobed; capsule $\frac{1}{4}$ in., depressed-globose, surrounded by slightly enlarged sep., seeds glabrous.

Open places in the low country; common. Fl. May, June; pale creamy yellow, red inside base of tube.

Throughout the Tropics of the Old World.

This is used in native medicine. *Convolvulus Medium*, L., is somewhat obscure, but is probably this. Linn. quotes for it doubtfully Fl. Zeyl. n. 475 (among the 'Barbaræ').

14. **I. tridentata,** *Roth.*, *Catal. Bot.* ii. 19 (1800). **Hawari madu,** *S.* **Muḍiyákúntal,** *T.*

Herm. Mus. 39. *Convolvulus tridentatus*, L., Moon Cat. 13. Thw. Enum. 211. C. P. 1929.

Fl. B. Ind. iv. 203. Burm. Fl. Ind. t. 16, f. 3.

Perennial with a small woody rootstock, stems numerous, prostrate, not twining, long, wiry, angular, glabrous; l. numerous, on very short petioles, small, under $\frac{3}{4}$ in., obovate-oblong, narrowed near base but there dilated into toothed auricles, rounded or truncate and mucronate at apex, often also acute and mucronate on each side so as to be 3-toothed, glabrous; fl. small, on slender curved ped., usually solitary, bracts minute, peduncle longer than l., very slender; sep. oval, acute, glabrous; cor. under $\frac{1}{2}$ in. diam.; capsule $\frac{1}{6}$ in., globose; seeds glabrous.

Sandy ground in the low country, especially in the dry region; very common. Fl. March.

Also in Peninsular India and Burma.

There is no specimen in Hermann's Herb. He gives as the S. name 'Apas' and 'Apathuætha.'

15. **I. reniformis,** *Choisy*, *Conv. Orient.* 64 (1833).

Thw. Enum. 211. C. P. 3597.

Fl. B. Ind. iv. 206. Burm. Fl. Ind. t. 30, f. 1 (*Evolvulus emarginatus*).

Perennial (?), stems numerous, creeping and rooting at nodes, not twining, filiform with scattered long hair; l. numerous, small, under $\frac{1}{2}$ in., reniform-ovate, obtuse, crenate, glabrous on both sides, petiole about as long as l., hairy; fl. very small, nearly sessile, solitary or 2 or 3 together, bracts linear, very small, hairy, peduncle extremely short; sep. glabrous but very strongly ciliate, 2 outer ovate, mucronate, 3 inner longer, deeply divided into two truncate divaricate lobes; cor. $\frac{1}{4}$–$\frac{1}{2}$ in. diam., lobes acute, capsule $\frac{1}{6}$ in., globose, smooth, surrounded by enlarged ciliate sep.; seeds glabrous.

Dry country in sandy places; rather rare. Trincomalie; Batticaloa; Tangalle; Kekirawa. Fl. March, July; yellow.

Also in India, Malaya, and Trop. Africa.

The ciliate bilobed inner sep. are a very marked character.

16. **I. chryseides,** *Ker in Bot. Reg.* t. 270 (1818). **Kaha-tel-kola,** *S.*

Convolvulus flavus, Moon Cat. 13 (non Willd.). Thw. Enum. 212. C. P. 1940.

Fl. B. Ind. iv. 206. Wight, Ic. t. 157.

Perennial (?), stems diffuse, twining, branched, glabrous but slightly rough with little prominences; l. small, 1–1½ in., cordate-ovate, with basal lobes deep and rounded, acute, apiculate, often 3-lobed, margin entire or coarsely dentate, glabrous, petiole 1 in., slender; fl. small, numerous, pedicellate, in short bifid racemose cymes, bracts small, caducous, peduncles stout, usually longer than petiole; sep. short, quadrate, truncate and faintly toothed at apex, lax, concave, spreading, glabrous, becoming chartaceous, stiff and reflexed in fruit; cor.-tube short and wide, limb ⅜ in. diam., distinctly lobed; stam. slightly exserted; capsule ¼ in., broadly ovate-ovoid; somewhat 4-angled, glabrous, transversely wrinkled; seeds with velvety fulvous pubescence.

Low country; rather common in both moist and dry regions. Fl. Dec., &c.; yellow.

Throughout the Old World Tropics.

17. **I. staphylina,** *Roem. & Sch. Syst. Veg.* iv. 249 (1819).

Trimen in Journ. Bot. xxiii. 172; Syst. Cat. Ceyl. Pl. 60.

Fl. B. Ind. iv. 210. Wight, Ill. t. 168 (*I. racemosa*).

Perennial, woody below, stems stout, straggling, slightly twining, glabrous; l. 2½–4 in., ovate, subcordate at base, subacute, glabrous on both sides, lat. veins numerous, conspicuous, petiole rather shorter than l.; fl. rather small or moderate-sized, on somewhat long glabrous ped., numerous, in large lax paniculate cymes exceeding the l.; bracts very early caducous; sep. rounded-oval, obtuse, glabrous; cor.-tubular-campanulate, limb about 1 in. diam.; capsule (not seen) ovoid; glabrous; 'seeds with long silky hairs.'

Low country; very rare. Near Kurunegala. Fl. Jan.; nearly white, purple in the tube.

Found also in S. India, Assam, and Penang.

My specimens are in young bud only.

18. **I. cymosa,** *Roem. & Sch. Syst. Veg.* iv. 241 (1819). **Kiri-madu, Maha-madu,** *S.*

Convolvulus bifidus, Vahl, Moon Cat. 13. Thw. Enum. 212. C. P. 1931.

Fl. B. Ind. iv. 211. Rumph. Herb. Amboin. v. t. 158 (?).

Perennial, stems very long, scandent, only slightly twining, often rooting at lower nodes, angular, slightly pubescent; l. rather small, 2–2½ in., oblong-ovate, slightly cordate at base, shortly acuminate, apiculate, finely hairy above and on the veins beneath, veins conspicuous, usually purplish, petiole ½–2 in., pubescent, thickened and prehensile at base; fl. rather large, on long glabrous ped., cymes branched, many-flowered, rather lax, bracts caducous, peduncle longer than petiole, glabrous; sep. broadly oval, glabrous, whitish, outer ones strongly apiculate; cor. tubular-funnel-shaped, limb near 2 in. diam., lobes obvious; capsule ⅓ in., globose, glabrous; seeds with long spreading hair.

Low country and up to 4000 ft. very common. Fl. white.
Throughout the Tropics of the Old World.

[*I. sidæfolia*, Choisy, is a Tropical American species, and has been for many years a common weed in Peradeniya Gardens. It is given as a Ceylon plant in DC. Prod. ix. 372. This is *Convolvulus zeylanicus*, 'Moon,' Wall. Cat. n. 1379—a name never published elsewhere. There is a good figure in Bot. Reg., 1843, t. 24, under the name of *I. cymosa.*]

19. **I. sepiaria,** *Kœnig in Roxb. Hort. Beng.* 14 (1814). **Rasa-tel-kola,** *S.* **Táli,** *T.*

Convolvulus maximus, L. f. Suppl. Pl. 137; Moon Cat. 13. Thw. Enum. 212. C. P. 1937.
Fl. B. Ind. 209. Wight, Ic. 838.

Perennial, stems twining, slender, glabrous or rarely hairy; l. 2–3½ in., ovate or broadly ovate, widely cordate at base, shortly acuminate, obtuse or subacute, glabrous, petiole 1–2½ in.; fl. moderate-sized, on glabrous ped., thickened with fruit, 4–8, rather crowded in umbellate or corymbose cymes, peduncle usually exceeding l., stout; sep. broadly oval, very obtuse, with membranous margins; cor. salver-shaped, tube about 1 in., limb about 1¼ in. diam., lobes obvious, acute; capsule ⅜ in., ovoid, glabrous; seeds grey with adpressed silky pubescence.

Var. β, **stipulacea,** *Clarke, l. c.* Var. *sagittata*, Thw. l. c. C. P. 2859.

L. usually smaller, angled or sagittate at base, narrower, apiculate; fl. smaller.

Low country; common, especially in dry region. Fl. July, August; white or pale pinkish-purple with violet tube.
Throughout India and Malaya.

20. **I. obscura,** *Ker in Bot. Reg.* t. 239 (1817). **Tel-kola,** *S.*

Burm. Thes. 74. *Convolvulus obscurus*, L. Sp. Pl. ed. 2. Moon Cat. 13. Thw. Enum. 212. C. P. 1935.
Fl. B. Ind. iv. 207. Bot. Reg. t. 239.

Stems very long and slender, twining, glabrous or with a few patent hairs, purple; l. 2–3 in., deeply cordate-ovate, acuminate, subacute, apiculate, glabrous or finely ciliate, thin, petiole 1½–2 in., glabrous or pubescent; fl. rather small, on stout glabrous or pubescent ped. about ¼ in. long, solitary or 2, peduncle 1¼–1¾ in., bracts very small, sep. nearly equal, ovate, shortly cuspidate; cor.-tube ⅜ in., cylindrical, rather wide, limb 1 in. diam.; capsule ⅜ in., ovate-ovoid, tipped with style, on thickened deflexed ped.; seeds ovoid, dark brown, densely velvety.

Low country in both dry and moist regions; common. Hantane; Dambulla; Anuradhapura; Colombo; Peradeniya. Fl. July–August; yellowish-white, with a small purple eye.

Throughout Tropics of Asia and Africa.

I. Gleniei, 'Thwaites in litt.,' described in Fl. B. Ind. iv. 208 from a scrap in Herb. Kew, which flowered at Kew in 1871 and is said to have been raised from seed sent by Thwaites, is not determinable. It is thought by Dr. Stapf to be an abnormal form of *I. sepiaria* or *I. obscura*.

21. **I. campanulata,** *L. Sp. Pl.* 160 (1753).
Thw. Enum. 211. C. P. 2847.
Fl. B. Ind. iv. 211. Wight, Ic. t. 1375.

Stems stout, widely twining, glabrous, younger ones finely pubescent; l. 3½–4½ in., broadly ovate, more or less cordate at base, acuminate, apiculate, glabrous or very finely pubescent on both sides, lat. veins numerous, conspicuous, petiole 1¼–3 in.; fl. very large, on stout, glabrous ped., 2–5, peduncle shorter than petiole, bracts inconspicuous, deciduous; sep. nearly ½ in., oval-rotundate, very obtuse, glabrous or finely pubescent, rather succulent; cor. 3 in. long, broadly tubular-campanulate, limb about 3½ in. diam., lobes usually conspicuous; capsule ½ in., globose, glabrous, enclosed in enlarged sep., seeds (not seen ripe) 'with long silky hair.'

Low country; rather rare. Hantane; Galle; Haragama. Fl. Dec.–Feb.; pale violet-mauve, dark purple in tube.

Also in S. India and Malaya.

Very like the common *Argyreia tiliæfolia*, but with still more handsome flowers.

22. **I. aquatica,** *Forsk. Fl. Ægypt.-Arab.* 44 (1775). **Kankuṇ,** *S.*
I. reptans, Poir., Moon Cat. 14. Thw. Enum. 211. C. P. 3535.
Fl. B. Ind. iv. 210. Rheede, Hort. Malab. xi. t. 52.

Annual or biennial, stems long, prostrate, creeping or floating, rooting at the nodes, thick, hollow, quite glabrous; l. 2–3 in., ovate-oblong, the base usually dilated and hastate with rounded or acute lobes, glabrous, paler beneath, petiole as long as or longer than l.; fl. rather large, on long glabrous

ped., usually solitary, often 2, peduncle much shorter than petiole, bracts small; sep. equal, lanceolate, subacute, glabrous; cor. tubular-funnel-shaped, limb about 2 in. diam., lobes obscure; capsule globose, seeds minutely pubescent.

Var. *β*, **parviflora,** *Trim.* C. P. 3941.

L. very narrow, the basal lobes linear, spreading; sep. ovate, acute, covered with elongated papillæ; cor. small $\frac{1}{2}$–$\frac{5}{8}$ in. diam.

In shallow water and wet places in the dry region; very common. Var. *β* near Trincomalie (Glenie). Fl. Aug., Sept.; nearly white, the throat and tube dull purple. Var. *β*, all white.

Throughout Tropical Asia, Australia, and Africa.

Cultivated as a vegetable and eaten as spinach. Kaṉ-kuṉ seems to be originally a Malay name. I have seen nothing like var. *β* from any other locality.

23. **I. repens,** *Lam. Enc. Méth.* vi. 18 (1804). **Bin-tamburu,** *S.*

Convolvulus repens, Moon Cat. 14 (? L.). *I. rugosa*, Choisy, Thw. Enum. 211. *I. Beladamboe*, R. & S., Trim. Syst. Cat. 60. C. P. 2850.

Fl. B. Ind. iv. 210 (*I. Beladamboe*). Wight, Ic. t. 887. Rheede, Hort. Malab. xi. t. 58.

Stems stout, prostrate, rooting at nodes, glabrous but rough, with small warty projections, l. 1$\frac{1}{2}$–2 in. long by 2–3 in. wide, reniform, very slightly cordate at base, apiculate, glabrous, rather thick, veins prominent beneath, often pink, petiole 1$\frac{1}{4}$–3$\frac{1}{2}$ in., erect, often rough with small points, purplish-pink; fl. on glabrous ped., thickened upwards, 1–3, peduncle shorter than petiole, bracts very small; sep. unequal, 2 outer $\frac{1}{2}$ in., broadly oval, obtuse, apiculate, thick, transversely wrinkled and puckered, 3 inner $\frac{1}{2}$ in., oval-oblong, membranous; cor. about 1$\frac{1}{2}$ in. diam.; capsule $\frac{1}{3}$ in. globose, smooth; seeds yellowish, glabrous.

Wet places in low country; very common. Fl. May, June; pink-purple.

Also in S. India.

Lamarck's name has long priority over that adopted in Fl. B. Ind. The flowers are frequently white.

24. **I. Turpethum,*** *Br. Prod. Fl. Nov. Holl.* 485 (1810). **Trastawalu,** *S.*

Herm. Hort. Acad. Lugd.-Bat. 177; Mus. 26. Burm. Thes. 71. Fl. Zeyl. n. 74. *Convolvulus Turpethum*, L. Sp. Pl. 155. Moon Cat. 13. *C. anceps*, L. Mant. 143. Thw. Enum. 212. C. P. 3649.

Fl. B. Ind. iv. 212. Herm. Hort. Acad. Lugd.-Bat. tt. 178, 179. Bot. Reg. t. 279. Bot. Mag. t. 2093.

---

* *Turbith* was the Arabic name of the roots known to the early writers on drugs; they were obtained from Surat and Cambay (see

Perennial, roots long, slender, fleshy, much branched; stems very long (15 or 20 ft. or more), not woody, much twining with one another, 3- (or 4-) angled with the angles usually widely winged, slightly pubescent, when old tough brown and fibrous, when young nearly cylindrical and densely pubescent; l. 2½–4 in., broadly ovate, shallowly cordate at base, subacute, mucronate, slightly repand but not lobed, more or less pubescent on both sides, especially when young, minutely reticulate, petiole ¾–2 in., slightly pubescent; fl. rather large, 2–4, on stout pubescent ped. thickened upwards, bracts large, lanceolate, pubescent, soon falling, peduncle about as long as petiole; sep. unequal, two outer much the largest, ovate, membranous, obtuse, glabrous, becoming much enlarged in fruit; cor. about 1½ in. diam.; capsule over ½ in., completely enclosed in enlarged, brittle, membranous-fleshy very imbricate sep., shortly stalked, depressed, strongly 4-lobed, slightly hairy; seeds large, glabrous.

Low country, in damp shady places; very doubtfully wild, but often cultivated. Fl. May; white.

Throughout the Tropics of the Old World.

Hermann, l. c., has a very long description and two figures. The root affords a glutinous milky juice, is much used as a purgative and said to be a good substitute for jalap. The fleshy enlarged sep. completely enclose the capsule, and are strongly imbricated, forming an ovate-ovoid, sharply pointed 'fruit' 1 in. long. *I. anceps*, R. & S., seems but a slight variety.

25. **I. denticulata,** *Chois. in DC. Prod.* ix. 379 (1845).
I. littoralis, Thw. Enum. 211 (non Bl.). C. P. 1939.
Fl. B. Ind. iv. 208.

Stems trailing, slightly twining, very slender, glabrous; l. very variable, 1–2½ in., cordate or hastate at base, acute or obtuse, mucronate, entire or more or less dentate or deeply 3- or 5-lobed, glabrous, petiole usually longer than l.; fl. rather large, on rather long glabrous ped., solitary or 2 or 3, bracts inconspicuous, peduncle very short; sep. ⅓ in., obovate-oblong, obtuse, mucronate, glabrous; cor. widely funnel-shaped, limb 1½ in. diam., lobes apiculate; capsule (not seen) 'globose, glabrous, seeds smooth.'

Sands of seacoast in moist region; rare. Galle; Kalutara. Fl. December; purple.

Also in Malaya, Nicobar Is., Polynesia, Australia, Seychelle Is.; not in Peninsular India.

Garcia, Arom. Hist. i. cap. 36). Hermann first determined their true botanical source.

26. **I. biloba,** *Forsk. Fl. Ægypt.-Arab.* 44 (1775). **Mudu-bin-tamburu,** *S.*

Herm. Hort. Acad. Lugd.-Bat. 174; Mus. 51, 65. Burm. Thes. 71. Fl. Zeyl. n. 75. *Convolvulus Pes-Capræ*, L. Sp. Pl. 159. Moon Cat. 14. Thw. Enum. 211. C. P. 1934.

Fl. B. Ind. iv. 212. Herm. Hort. Acad. Lugd.-Bat. t. 175. Rheede, Hort. Malab. xi. t. 57.

Root large, long, with a thick brown bark, stems numerous, very long, prostrate, weak, not twining nor rooting, cylindrical, glabrous; l. about 1 in. long, twice as broad, deeply bilobed, lobes obliquely oval, spreading, subcoriaceous, glabrous, venation conspicuous, pellucid, midrib terminating in a mucro between the lobes, petiole 2–4 in., erect, glabrous, with two glandular spots at the summit; fl. very large, solitary, on ped. about 1½ in. long, bracts lanceolate, soon falling, peduncle erect, usually shorter than petiole; sep. scarcely ½ in., broadly oval, subacute, cor. widely funnel-shaped, 3 in. diam., fil. dilated and hairy at base; capsule '½ in., ovoid, glabrous; seeds pubescent, dark brown.'

Sand of the seashore; very common. Fl. Oct.–Dec.; brilliant purplish-rose, deeper in the tube.

Throughout the Tropics.

A beautiful ornament of our sandy coasts. The roots and leaves are used in medicine. Hermann, l. c., has a long account.

27. **I. vitifolia,** *Sweet, Hort. Brit. ed.* 2, 372 (1830).

Thw. Enum. 426. C. P. 3685.

Fl. B. Ind. iv. 213. Burm. Fl. Ind. t. 18, f. 1.

Perennial, stems long, stout, much branched, twining, young branches with spreading deciduous hair, l. 2½–6 in., as broad as long, palmately cut about ⅓ down into 5 or 7 broad acuminate lobes, margin coarsely serrate-dentate, glabrous above, coarsely hairy on veins beneath, petiole shorter than l., bristly-hairy; fl. rather large on short ped., 1–5, cyme short, racemose, bracts linear, caducous, peduncle rather longer than petiole, buds pointed; sep. broadly oval, obtuse, bristly, enlarged in fruit, outer ones shorter, apiculate; cor. campanulate-funnel-shaped, limb 2 in. diam.; capsule '½ in., depressed-globose, membranous; seeds glabrous.'

Moist low country; rather rare. About Colombo; Hapittigam Korale; Ambépussa, Rambukkama, &c., frequent. Fl. Dec.–Feb.; bright pale yellow.

Also in India, Burma, and Malaya.

A beautiful species even when out of flower, the younger leaves being bronze-coloured.

[*I. kentrocaulos*, Clarke. This is given in Fl. B. Ind. for Ceylon, apparently following Choisy (l. c. 362). No specimens are known. The closely allied *I. tuberosa*, L., of the West Indies, is, however, commonly cultivated in gardens, and was probably mistaken for it.]

28. **I. palmata,** *Forsk. Fl. Ægypt. Arab.* 43 (1775).
Thw. Enum. 212. C. P. 3387.
Fl. B. Ind. iv. 214. Wight, Ic. t. 156 (*I. pulchella*). Bot. Reg. t. 632 (*I. pendula*). Bot. Mag. t. 699 (*Convolvulus cairicus*).

Stems numerous, very slender, twining, glabrous, the old ones semi-woody, often rough with lenticels; l. rather small, compound, lflts. 5, sessile, oval, tapering at base, obtuse, mucronate, glabrous on both sides but rough with minute asperities above, finely spinous-ciliate on margin, pale beneath, the terminal one the largest $1\frac{1}{4}$–$1\frac{3}{4}$ in., petiole about as long as l., prehensile at base; fl. large, usually solitary often 2 or 3, on swollen ped. about $\frac{1}{2}$ in. long, bracts minute, peduncle very short, curved downwards; sep. barely $\frac{1}{4}$ in., ovate, obtuse, with white spots on inside, glabrous, the 2 outer apiculate; cor. widely funnel-shaped, $3\frac{1}{2}$ in. diam.; capsule globose, nearly $\frac{1}{2}$ in., glabrous; seeds pubescent, with a marginal fringe of long hair.

Moist low country; very rare. Only from Ambagamuwa District. Fl. Feb.–June; dull violet, purple in the tube.

Throughout the Tropics.

The large flowers are attractive from their peculiar colour, and the plant is a good deal cultivated. The plant figured in Bot. Mag. t. 4305 as *I. pulchella*, and said to have been raised in 1845 from seeds sent from Ceylon, appears to be a different species, and not a native of this country.

29. **I. dasysperma,** *Jacq. Ecl.* i. 132 (1816).
Fl. B. Ind. iv. 215 (not given for Ceylon). Bot. Reg. t. 86 (*I. tuberculata*).

Stems twining, glabrous but slightly rough with small prominences; l. 2–3 in., very nearly compound, broadly ovate or rotundate in outline, pinnately cut nearly to midrib into 5 oval acute segm., the basal ones pedately again cut into 2 or 3 lobes, glabrous, thin, petiole $1\frac{1}{2}$–to $2\frac{1}{2}$ in.; fl. moderate-sized, on swollen warted ped., 1–3, peduncle stout, shorter than petiole; sep. oval, very obtuse, glabrous; cor.-tube cylindrical, rather narrow, limb flat, nearly 2 in. diam., lobes obvious; capsule nearly $\frac{1}{2}$ in., globose; seeds velvety-pubescent, with a fringe of very long silky hair.

Dry country; very rare. On site of Tirukketisvaram, Mantai, N. Prov. Fl. Feb.; pale buff, with shaded violet centre.

Also in Peninsular India.

6. HEWITTIA, *W. & A.*

Differs from *Ipomœa* only in the stigmas being ovoid instead of globular.—Monotypic.

H. bicolor, *W. & A. in Madras Journ. Sc. & Art*, v. 22 (1837).
Wal-trasta-walu, *S.*

Shutereia bicolor, Chois., Thw. Enum. 212. C. P. 1970.
Fl. B. Ind. iv. 216 (not given for Ceylon). Wight, Ic. t. 835. Bot. Mag. t. 2205.

Stems very long, prostrate or twining, cylindrical, densely pubescent, much branched; l. numerous, 2–4 in., rather variable, broadly ovate, cordate at base, obtuse, apiculate, usually palmately lobed, more or less softly pubescent on both sides, petiole shorter than l., pubescent; fl. solitary or 2 or 3, nearly sessile, bracts linear, peduncle as long as or longer than petiole, pubescent, sep. ½ in., acute, pubescent, 2 outer ovate, the others linear, cor. broadly funnel-shaped, about 1¾ in. diam., pubescent outside; ov. covered with long erect silky hair; capsule ¼ in., subglobose, very hairy, surrounded by moderately enlarged sep., seeds.

Low country in both dry and moist region, but principally in the former; common. Fl. June; pale sulphur-yellow, with a dark purple eye.

Also in India, Malaya, and Trop. Africa.

7. CONVOLVULUS, *L.*

Herbaceous, stems twining, fl. small, in dense axillary cymes; sep. 5, unequal, 2 outer longest; cor. broadly funnel-shaped; stam. 5, slightly exserted; ov. 2-celled, with 2 ovules in each cell, styles 2, stigmas oblong, capsule globose, seeds glabrous.—Sp. 150; 11 in *Fl. B. Ind.*

C. parviflorus, *Vahl, Symb. Bot.* iii. 29 (1794).

Trimen in Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 220.

Stems twining, cylindrical, nearly glabrous, young parts pubescent; l. 2–3 in., ovate, cordate at base, acuminate, acute, glabrous or nearly so, petiole ½–1¼ in.; fl. small, numerous, ped. pubescent, cymes dense, peduncle 1–1½ in., usually longer than petiole; sep. lanceolate, acuminate, acute, pubescent; cor. ⅜ in. long, limb nearly ½ in. diam., lobes short triangular, acute; capsule ⅙ in., smooth.

Dry country; very rare. Abundant about Tissamaharama, near Hambantota; near Wélimade, Uva? Fl. Dec.; white.

Throughout the Tropics of Asia, Africa, and Australia.

8. EVOLVULUS, *L.*

Perennial, stems prostrate, not twining; l. small; fl. small, 1 or 2, on axillary peduncles; sep. 5, equal, not enlarged in

fruit; cor. nearly rotate, lobes obscure; stam. 5, exserted; ov. 2-celled, with 2 ovules in each cell, styles 2, each deeply bifid, stigmas linear; capsule globose, 4-valved, usually 4-seeded.—Sp. 70; 1 in *Fl. B. Ind.*

E. alsinoides, *L. Sp. Pl. ed.* 2, 392 (1762). **Visnu-kranti,** *S.* **Vichnukiránti,** *T.*

Herm. Mus. 11, 37, 56. Burm. Thes. 11, 19. Fl. Zeyl. n. 76. Moon Cat. 23. Thw. Enum. 213. C. P. 1926.

Fl. B. Ind. iv. 220. Burm. Thes. t. 9, and t. 6, f. 1. Wight, Ill. t. 168 b, f. 10.

Perennial herb with a small woody branched rootstock, stems numerous, prostrate, speading, slender, wiry, usually with long spreading hair; l. numerous, $\frac{1}{4}$–$\frac{5}{8}$ in., nearly sessile, oblong-oval, usually acute at base, very obtuse but apiculate, generally densely covered with long hair on both sides; fl. small, on short filiform ped., solitary or 2, bracts small, linear-lanceolate, persistent, peduncle filiform, hairy, usually longer than l.; sep. lanceolate, acute, very hairy; cor. $\frac{3}{8}$ in. diam.; capsule very small, seeds glabrous.

Dry sandy ground in the low country up to 2000 ft.; very common. Fl. all the year; bright light blue.

Throughout the Tropical and Sub-tropical World.

E. hirsutus, Lam., is sometimes distinguished as a species, but there is every gradation between nearly smooth and very hairy. One of our most familiar plants; the intensely bright-blue flowers, though small, are very attractive. Much used as a bitter tonic and febrifuge.

[*Porana paniculata*, Roxb., given for Ceylon in Fl. B. Ind. iv. 222, has no claims to nativity here, but is commonly cultivated. The Kew specimens were from Sir J. Stewart Mackenzie.]

9. BREWERIA, *Br.*

Perennial climber, l. large, cordate, densely tomentose, fl. rather large, in axillary cymes; sep. 5, nearly equal; cor. widely funnel-shaped, hairy outside; stam. 5, included; ov. 2-celled, with 2 ovules in each cell, style 1, cleft half way down, stigmas globose; capsule dehiscent vertically by many valves; seeds 4, glabrous.—Sp. 23; 4 in *Fl. B. Ind.*

B. cordata, *Bl. Bijdr.* 722 (1825).

Convolvulus malabaricus, Moon Cat. 13 (? L.). *B. Roxburghii*, Chois., Thw. Enum. 213. C. P. 2853.

Fl. B. Ind. iv. 223. Wight, Ic. t. 1370.

Stems stout, twining, cylindrical, densely tomentose; l. large, 3–5 in., cordate-ovate with rounded lobes, acuminate, obtuse, apiculate, entire, finely pubescent above, densely

velvety-tomentose beneath, petiole 1–2 in., tomentose; fl. rather large, on long tomentose ped., 3–9, bracts oblong, tomentose, peduncle stout, much longer than petiole; sep. oval, acute, tomentose, outer ones leafy; cor. widely funnel-shaped, 1½ in. long, hairy outside, 2 in. diam.; capsule depressed-globose, rather over ½ in., glabrous, surrounded by enlarged concave sep., seeds glabrous, dull black.

Moist low country; rather rare. Kalutara (Moon); Colombo; Galle; Fl. Dec.; pure white.

Also in S. India, E. Bengal, and Malaya.

Linnæus's *Convolvulus malabaricus* was founded on Rheede, Hort. Malab. xi. t. 51, a doubtful plant which Choisy refers to *Argyreia*, and it appears as *A. malabarica*, Chois. in Fl. B. Ind. iv. 189. Moon may, however, have more correctly referred it to the present species.

10. **CRESSA,** *L.*

Erect dwarf shrub, l. very small, sessile, fl. very small, sessile, axillary; sep. 5, equal, not enlarged in fruit; cor.-tube funnel-shaped, lobes 5, reflexed; stam. 5, exserted; ov. 2-celled with 2 ovules in each cell, styles 2, simple, stigmas globose; capsule 2–4-valved, 1–4-seeded.—Monotypic.

C. cretica, *L. Sp. Pl.* 223 (1753). **Paṇittánki,** *T.*
Evolvulus capitatus, Moon Cat. 23. Thw. Enum. 213. C. P. 1925. Fl. B. Ind. iv. 225. Lam. Ill. Gen. t. 183.

Stem 3–9 in. high, erect, slender, very much branched, very hairy; l. numerous, ⅛–¼ in., narrowly ovate, rounded at base, acute, densely covered with grey pubescence mixed with longer hairs; fl. sessile, in the axils of upper l., forming short close spikes; sep. lanceolate, acute, pubescent; cor.-tube ⅛ in., glabrous, lobes oblong-lanceolate, acute, slightly hairy.

Sandy seacoast in the dry region; rather common. Jaffna; Mannar; Trincomalie. Fl. Feb.–April; white tipped with pink.

Throughout the warmer regions of the world.

Our plant is *C. indica*, Retz., but I have not been able to get ripe capsules to determine the number of seeds.

11. **CUSCUTA,** *L.*

Leafless twining annuals, parasitic on stems and l. of other plants by disks, fl. small in lateral clusters; sep. 5, distinct or connate, equal; cor. more or less campanulate, with 5 scales within; stam. 5, inserted in throat of cor.-tube; ov. 2-celled, with 2 ovules in each cell, style solitary or 2, stigmas oblong or capitate; fruit a capsule, often somewhat fleshy, dehiscent by a ring near the base, 2–4-seeded; seed with a filiform

embryo without cotyledons, coiled in fleshy endosperm.—Sp. 80; 7 in *Fl. B. Ind.*

Style 1, very short, stigmas large, oblong-linear . . 1. C. REFLEXA.
Styles 2, stigmas small, globose . . . . . . 2. C. CHINENSIS.

1. **C. reflexa,** *Roxb. Corom. Pl.* ii. 3 (1798).
Thw. Enum. 213. C. P. 1922.
Fl. B. Ind. iv. 226. Hook. Exotic Fl. t. 150. Bot. Mag. t. 6566.

Stems very long, stout, closely twining, branched, glabrous, succulent and brittle, pale greenish-yellow, sometimes dotted with red; fl. on short, glabrous, curved ped., solitary or in umbellate clusters of 2–4, or in short racemes, bracts short, fleshy; sep. broadly oval, obtuse, glabrous, fleshy; cor.-tube over $\frac{1}{4}$ in., campanulate or urceolate, lobes very short, triangular, acute; scales almost at base of cor.-tube, obovate-oblong, incurved tomentose; fil. very short; style solitary, short, stigmas 2, oblong, capsule rather over $\frac{1}{4}$ in., depressed-globose, apiculate, glabrous; seeds usually 2, rather large, glabrous, dull black.

Upper montane zone, rather common; parasitic, especially on species of *Strobilanthes* in the forests. Fl. December; white, scented.

Apparently throughout India and Malaya.

It is remarkable that this is entirely a high montane plant in Ceylon. The figure in 'Exotic Flora' shows a much larger and differently shaped corolla.

C. chinensis, *Lam. Enc. Méth.* ii. 229 (1786). **Aga-mulá-néti-wel,** *S.*
C. reflexa, Moon Cat. 12 (non Roxb.). Thw. Enum. 213. C. P. 611.
Fl. B. Ind. iv. 227. Wight, Ic. t. 1373 (from a Ceylon specimen).

Stems very slender, closely twining, much branched, forming a tangled mass; fl. sessile or on very short ped., solitary or in little heads of 2–4; sep. connate into a cal., segm, triangular, subacute; cor. campanulate, lobes lanceolate, acute, spreading, scales at throat of cor. just below stam., ciliate; fil. rather long, exserted; styles 2, rather long, stigmas capitate; capsule dry, divided into 2 lobes by a deep furrow on top, hyaline; seeds small, slightly rough, black.

Moist low country; very rare. Only found about Colombo, parasitic on grass and low herbs and shrubs. Fl. Nov., Dec.; white.

Tropical and warm Asia and Australia, usually a seashore plant.

XCI.—SOLANACEÆ.

HERBS or shrubs, l. alt. (but often 2 at a node), without stip., fl. regular, bisexual, in extra-axillary or terminal cymes or solitary; cal. free, usually persistent, often enlarged in fruit, segm. 5 (rarely more); cor. rotate or funnel-shaped, lobes 5, plaited or valvate in bud; stam. 5, inserted on cor.-tube, anth. opening by pores or vertical slits; ov. 2-celled, with very numerous ovules on prominent placentas, style and stigma simple; fruit a 2-celled berry (capsule in *Datura*); seeds very numerous, compressed, embryo curved round central endosperm.

Fruit a berry.
  Anth. opening by pores at apex . . . 1. SOLANUM.
  Anth. opening longitudinally.
    Fl. solitary . . . . 2. PHYSALIS.
    Fl. in umbellate cymes . . . . 3. WITHANIA.
Fruit a prickly capsule . . . . . 4. DATURA.

Of our 10 species of *Solanum*, 2, *S. læve* and *S. giganteum*, are restricted to the hill zone, and 2 more, *S. pubescens* and *S. trilobatum*, to the dry region; the other 6 and the 3 species of other genera are of more general distribution. We have no endemic species.

1. **SOLANUM,** *L.*

Herbaceous or shrubby perennials, rarely annuals, often armed with prickles; l. alt. or two at a node, fl. in umbellate, racemose, or corymbose cymes which are usually extra-axillary, at first appearing terminal; cal.-segm. 5 (rarely 7–10); cor. rotate with a very short tube, lobes 5, plaited in bud; stam. 5, inserted in cor.-throat, fil. very short, anth. large, connivent (but not connate) into an exserted cone, opening by two apical pores; ov. 2-celled, style simple, long, often slightly curved, stigma small; fruit a globose berry, seeds very numerous, flattened, circular, embryo curved in a circle round fleshy endosperm.—Sp. about 700; 27 in *Fl. B. Ind.*

Without prickles.
  Annual; cal. glabrous, berry black . . 1. S. NIGRUM.
  Perennial usually shrubby; berry red or yellow.
    L. under 5 in., cal. glabrous or pubescent.
      Cal. glabrous, segm. toothlike or linear . 2. S. LÆVE.
      Cal. pubescent, segm. lanceolate . . 3. S. PUBESCENS.

L. over 5 in., cal. densely tomentose.
Fl. white . . . . 4. S. VERBASCIFOLIUM.
Fl. purple. . . . . . . 5. S. GIGANTEUM.
More or less prickly.
Berry densely hairy . . . . . . 6. S. FEROX.
Berry smooth.
Fl. white . . . . 7. S. TORVUM.
Fl. purple.
L. over 2 in.; berry yellow.
Cymes many-flowered . . . . 8. S. INDICUM.
Cymes 1-flowered . . . . . 9. S. XANTHOCARPUM.
L. under 2 in., berry scarlet . . . 10. S. TRILOBATUM.

1. **S. nigrum,** *L. Sp. Pl.* 266 (1753). **Kalu-kaṇ-weriya,** *S.* **Manaltakalli,** *T.*

Moon Cat. 15. Thw. Enum. 216. *S. nodiflorum*, Jacq., Moon Cat. 15. C. P. 2865.

Fl. B. Ind. iv. 229. Wight, Ic. t. 344 (*S. rubrum*).

Annual, 2–3 ft., stem erect, cylindrical, thickened at the nodes, glabrous or more or less hispid-pubescent, much divaricately branched, l. numerous, ovate-lanceolate, tapering into obscure petiole, acuminate, subacute, usually entire, sometimes sinuate-dentate, glabrous, thin and flaccid; fl. small, on slender glabrous ped., cymes extra-axillary, 3–7 flowered, umbellate, peduncle $\frac{1}{2}$–$\frac{3}{4}$ in., slender, divaricate; cal. very small, glabrous, segm. linear-oblong, reflexed and not enlarged in fruit; cor. under $\frac{1}{4}$ in., lobes very deep, lanceolate-linear, acute; berry $\frac{1}{4}$ in. diam., shining, purplish-black; seeds minute, in watery pulp, finely shagreened.

A weed in cultivated ground; common throughout the island, especially in montane zone. Fl. all the year; white.

Throughout the world in temperate and Tropical countries.

The Ceylon form of this variable plant always has very small flowers and small purple-black berries, and does not much vary.

2. **S. læve,** *Dunal, Solan. Syn.* 22 (1816). [PLATE LXVII.]

S. membranaceum, Wall., Thw. Enum. 216. C. P. 1900.

Fl. B. Ind. iv. 231 (*S. bigeminatum*, var. *zeylanicum* and *S. denticulatum.*)

Semi-shrubby, stem slender, 2–4 ft., slightly branched, cylindrical, glabrous or with a few simple hairs; l. 2$\frac{1}{2}$–6 in. (upper ones the smallest), often in unequal pairs, lanceolate, much tapering at both ends, acuminate or caudate, acute, glabrous or slightly rough with a few short erect hairs, sometimes ciliate, entire or very slightly denticulate, thin, petiole obscure; fl. small, on slender, usually glabrous, ped., 2–10, in sessile umbellate axillary cymes; cal. small, glabrous, with 5–10 tooth-like segm. which are short, thick, distant, blunt, spreading (star-like in bud), somewhat enlarged in fruit and

then truncate with the short teeth below the edge and pointing downwards; cor. about ½ in., lobes deep, linear-lanceolate, very acute; berry ⅓ in., crimson-red.

Var. β, **pubescens,** *Trim.* *S. denticulatum*, Thw. Enum. 216 (? Bl.). C. P. 2864.

L. more or less hispid-pubescent on both sides, cal.-segm. 5, distant, linear, not thick; berry rather larger.

Montane zone from 4000–7000 ft.; rather common. Fl. Sept.–Feb.; white, sometimes tinged with violet.

Also in the mountains of S. India and Malaya.

I do not think we have more than one species here, but it is very variable; the calyx-teeth vary from short, thick, and fleshy to linear and lax. A form with lobed or angular leaves, *S. Gonakai*, Dun., is recorded from Ceylon in Fl. B. Ind.

S. bigeminatum, Nees, does not seem to require separation from *S. læve*, and *S. denticulatum*, Bl., appears to be distinguished only by the constantly more numerous (over 5) cal.-teeth (see Wight, Ic. t. 1397).

3. **S. pubescens,** *Willd. Phytogr.* 5 (1794).
Thw. Enum. 216. C. P. 1901.
Fl. B. Ind. iv. 230. Wight, Ic. 1402.

Shrubby, branched, covered when young with very fine stellate pubescence, l. 2½–5 in., ovate-oblong, acute at base, subacute, slightly sinuate, glabrous above, with few stellate hairs beneath, petiole ½–2 in., stellate-pubescent; fl. on rather long ped., which become thickened in fruit, cymes at first terminal, becoming leaf-opposed, racemose, simple, peduncle short, ¼–¾ in.; cal. slightly stellate-pubescent, segm. lanceolate, acute, cor. ¾ in. diam. or more, lobes long, oblong, acute; berry ⅓ in., glabrous, 'red.'

Dry region, rare. Polonarua; Anuradhapura (Gardner); Minery (Thwaites). Fl. Feb.; 'purple.'

Also in Peninsular India.

I have not met with this.

4. **S. verbascifolium,** *L. Sp. Pl.* 263 (1753). **Hékarilla,** *S.*
S. auriculatum, Ait., Moon Cat. 15; Thw. Enum. 216. C. P. 1902, 3525.
Fl. B. Ind. iv. 230. Wight, Ic. t. 1398 (not good).

A large shrub, 6–10 ft., whole plant covered with a dense yellowish-grey tomentum of scurfy stellate hair; l. large, 5–9 in., lanceolate-oval, rounded or acute at base, acuminate, subacute, tomentum velvety above, very woolly beneath, petiole ¾–1 in., stout; fl. numerous, on short, nodding, very woolly ped., cymes terminal, becoming lateral, dichotomous, dense, corymbose, peduncle 2–4 in., stout, erect; cal. cup-shaped, very woolly, segm. short, broadly triangular, acute; cor. ½ in. diam., woolly or pubescent outside, lobes deep, oval-oblong,

subacute; berry $\frac{1}{3}$ in., covered with small, scattered, stellate hairs, yellow; seed minutely shagreened.

Moist region, 1000–6000 ft., common. Fl. June, July, &c.; dull white. Throughout the Tropics.

Roots and leaves used in native medicine. *S. auriculatum*, Ait., appears to differ only by the possession in the leaf-axils of a pair of small leaves simulating stipules. It is C. P. 3525, and perhaps only a garden escape here; the name is not mentioned in Fl. B. Ind.

5. **S. giganteum,** *Jacq. Collect.* iv. 125 (1790).
Moon Cat. 16. Thw. Enum. 216. C. P. 1903.
Fl. B. Ind. iv. 233. Wight, Ic. t. 893.

A shrub, stem 6–12 ft., stout, branches few, erect, densely tomentose, with close stellate hair and with a few small compressed straight prickles; l. large, 6–9 in., oblong-lanceolate, tapering to both ends, often unequal-sided at base, entire, glabrous above (when young, scurfy with stellate hair), quite white, with fine stellate tomentum beneath, petiole 1–1$\frac{1}{2}$ in., tomentose; fl. numerous, rather small, on short, nodding, tomentose ped., cymes extra-axillary, often apparently terminal, corymbose-paniculate, tomentose, peduncle short, stout; cal. flocculently stellate-tomentose, lobes short, triangular; cor. $\frac{1}{2}$ in. diam., lobes oblong-lanceolate, acute; berry $\frac{1}{3}$ in., supported on enlarged cal., smooth, scarlet.

Forests of the montane zone, 3000–7000 ft., common. Moon s locality is Maturata. Fl. Feb.; pale purple.

Also in mountains of S. India, and in S. Africa.

6. **S. ferox,** *L. Sp. Pl. ed.* 2, 267 (1762). **Malabatu,** *S.*
Moon Cat. 16. Thw. Enum. 216. C. P. 2868.
Fl. B. Ind. iv. 233. Wight, Ic. t. 1399.

A large herb, stem stout, very densely covered with long, coarse, stalked, stellate hairs, and armed with numerous straight slender prickles; l. usually 2 at a node and unequal, large, 6–10 in., broadly oval in outline, pinnately cut into few large acutely triangular lobes, softly stellate-hairy on both sides (especially beneath), and with long erect yellow prickles on the veins; fl. large, on short stellate-tomentose ped., 2–6 in leaf-opposed cyme, peduncle very short, with few prickles; cal. shaggy with long stellate hair, slightly enlarged in fruit, segm. ovate, acute; cor. 1$\frac{1}{4}$ in. diam., very hairy outside, lobes lanceolate, acute; berry surrounded at base by cal., $\frac{3}{4}$ in., very densely clothed with long yellow bristly hair.

Low country and up to 4000 ft., rather common; sometimes cultivated. Fl. Jan.; white.

Also in India, Burma, and China.

The ripe fruit is eaten, according to Thwaites. The root is used as a remedy in cutaneous diseases.

S. ciliatum, Lam., a Brazilian species, very prickly, with a large bright-red globular fruit and white flowers, is a common weed about Peradeniya and Hakgala; no doubt escaped from the Gardens.

7. **S. torvum,** *Sw. Prod. Fl. Ind. Occ.* 47 (1788).
Thw. Enum. 216. C. P. 2867.
Fl. B. Ind. iv. 234. Wight, Ic. t. 345.

Semi-shrubby, 3–6 ft., stems with long internodes, cylindrical, brittle, with silvery-grey lenticellate bark, younger branches densely stellate-hairy, prickles usually very few, short and distant; l. 4–5 in., rotundate-oval, rounded and generally unequal-sided at base, acute, sinuate or very shallowly lobed, stellate-hairy on both sides, densely so beneath, without prickles, petiole $\frac{3}{4}$–1 in., stellate-tomentose; fl. on glandular-pubescent ped. which become much thickened with fruit, rather numerous, cymes dichotomous, racemose, rather dense, peduncle very short, bracts 0; cal. glandular-pubescent, lobes lanceolate, acute; cor. $\frac{3}{4}$–1 in. diam., pubescent outside, lobes triangular, long-acuminate; berry $\frac{5}{8}$ in., on swollen nodulated ped., glabrous, glaucous green, cal. at base slightly enlarged; seeds smooth.

A weed in waste and cultivated ground in the moist region to 5000 ft., very common. Fl. all the year; white.

Throughout Tropical Asia and America.

The flowers are always white here.

8. **S. indicum,** *L. Sp. Pl.* 187 (1753). **Tibbatu,** *S.*
Herm. Mus. 25, 31, 65. Burm. Thes. 220. Fl. Zeyl. n. 94. Moon Cat. 16. Thw. Enum. 217. C. P. 1904.
Fl. B. Ind. iv. 234. Burm. Thes. t. 102. Wight, Ic. t. 346.

Semi-shrubby, 1–3 ft., stem stout, much branched, often purple, with many scattered, large, slightly curved, sharp prickles with long compressed base, covered (including prickles) with a scurfy coating of minute white stellate hair, denser on the young parts; l. 4–6 in., ovate in outline, caudate or rounded, often unequal-sided at base, acute, with a few large oval-triangular subacute lobes, rough above with stalked stellate hair, white-tomentose beneath with the same, veins with a few large straight spines on both sides, petiole $\frac{1}{2}$–2 in., armed like the stem; fl. large, numerous, on short stellate-hairy and prickly ped. $\frac{1}{2}$ in. long, cymes racemose extra-axillary, peduncle short; cal. small, stellate-hairy, segm. oblong-lanceolate, subacute; cor. 1–1$\frac{1}{2}$ in. diam., stellate-hairy outside, lobes ovate-oblong, acute, somewhat crumpled at margins; berry $\frac{3}{8}$ in., surrounded at base by large spreading cal., smooth (with a few stellate hairs on summit), dark yellow.

A weed in waste ground, roadsides, &c., throughout the island up to 6000 ft. Fl. April, May; violet or purple.

Throughout Tropical Asia.

Hermann calls this 'Malabathu,' which is *S. ferox.* In the mountain region the flowers are larger and more brilliant in colour, and the leaves less lobed.

The root is much used as a remedy in bronchitis and asthma. The berry is a food in times of scarcity.

S. Melongena, L. (*S. insanum*, L.) is the 'Wambatu,' Bringal or Egg-plant, much cultivated for its fruit used as a vegetable, and often occurring semi-wild. Its native home is not known. The specimen in Hermann's Herb., Fl. Zeyl. n. 93, is quite without prickles.

9. **S. xanthocarpum,** *Schrad. & Wendl. Sert.* i. 8 (1795). **Ela-batu,** *S.* **Vaddu,** *T.*

Herm. Mus. 34. Burm. Thes. 219. Fl. Zeyl. n. 95. *S. sodomæum*, L. Sp. Pl. 187 (in part); Moon Cat. 16. Thw. Enum. 217. C. P. 1907. Fl. B. Ind. iv. 236.

Perennial herb, often semi-woody at base, 1–3 ft., stem somewhat zigzag, with numerous divaricate spreading branches, set with scattered straight compressed yellow prickles, younger ones with dense stellate tomentum; l. $2\frac{1}{2}$–4 in., oblong-oval, rounded and usually unequal-sided at base, obtuse or subacute, shallowly pinnately lobed, stellate-hairy on both sides, especially beneath, with a few straight erect prickles on midrib above and beneath, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., stellate-tomentose and prickly; fl. rather large, on short curved stellate-hairy ped., cymes usually only 1-flowered, extra-axillary, peduncle very short or 0; cal. stellate-hairy and with long prickles like those on l., segm. linear-lanceolate, acute; cor. about 1 in. diam., stellate-pubescent outside, lobes very broad, acute; berry 1 in., surrounded by much-enlarged cal., glabrous and shining, yellow or whitish with green veins, ped. thickened upwards, channelled.

Var. β, **Jacquini,** *Thw. l. c.* *S. Jacquini*, Willd., Moon Cat. 16. Wight, Ic. t. 1401. C. P. 1905. **Katu-wel-batu,** *S.* **Kandan-kattari,** *T.*

Stems nearly glabrous, with more numerous and longer prickles, l. smaller, deeply lobed, often nearly glabrous, but with very numerous and long sharp bright yellow prickles.

Very common as a roadside weed, up to 6000 ft.; var. β, in the dry region in sandy places. Fl. all the year; bright mauve-purple.

Throughout Tropical Asia, Australia, and Polynesia.

Linnæus's name *S. sodomæum* included also an African and Mediterranean species, to which it is now generally restricted. The specimen in Hermann's Herb. is in fruit, and referable to var. *Jacquini* (*S. Jacquini*, Willd.). He gives the S. name 'Tibbuthu' for it, which properly belongs to *S. indicum.* The plant is very variable as to size and amount of prickles; in the type they and the stem are often purple or nearly black.

The fruits are eaten. The root is a valued native medicine in fevers, coughs, and indigestion.

10. **S. trilobatum,** *L. Sp. Pl.* 188 (1753). **Wal-tibbatu,** *S.* **Tutuvalai,** *T.*
Moon Cat. 16. Thw. Enum. 217. C. P. 1906.
Fl. B. Ind. iv. 237. Wight, Ic. t. 854. Bot. Mag. t. 6866.

A small undershrub, subscandent by its numerous hooked prickles, stems slender with long divaricate branches, with a few stellate hairs on the young shoots, otherwise glabrous, provided with many flattened, hooked, decurved, very sharp prickles; l. small, $\frac{3}{4}$–$1\frac{1}{2}$ in., rotund-ovate in outline, obtuse, irregularly 3- or 5-lobed, glabrous, often with 2 or 3 small curved prickles on midrib, petiole as long as l., prickly; fl. large on long divaricate or reflexed glabrous ped., cymes extra-axillary, short, racemose, 3–9-flowered, nearly sessile; cal. small, slightly stellate-hairy, segm. lanceolate, acute; cor. $1\frac{1}{4}$–$1\frac{1}{2}$ in. diam., stellate-pubescent outside, lobes very deep, oblong-oval, obtuse, usually reflexed; berry $\frac{1}{3}$ in., smooth, scarlet.

Waste ground in the dry region, very common. Fl. Dec.–Feb.; rich violet-purple.

Also in S. India and Malay Peninsula.

This has the most handsome flowers of our species. The berries are eaten, and the whole plant is used as a medicine in catarrhal fevers.

2. PHYSALIS, *L.*

Annual, l. alt., fl. small, solitary; cal. broadly campanulate, becoming much enlarged and inflated in fruit, segm. 5, short; cor. funnel-shaped, stam. 5, inserted on base of cor.-tube, not connivent, anth. dehiscing by vertical slits; ov. 2-celled, with very numerous ovules; fruit a berry, enclosed in the loose, inflated, membranous, enlarged cal., seeds compressed, reniform, finely muriculate, embryo curved round endosperm.—Sp. 30; 1 in *Fl. B. Ind.*

P. minima, *L. Sp. Pl.* 183 (1753). **Mottu, Hin-mottu,** *S.*
Herm. Hort. Acad. Lugd.-Bat. 569. Burm. Thes. 11. Moon Cat. 15. *P. Hermanni*, Dun. in DC. Prod. xiii. 1, 444. Thw. Enum. 217. C. P. 2866.
Fl. B. Ind. iv. 238. Herm. Hort. Acad. Lugd.-Bat. t. 571. Wight, Ill. t. 166 B, f. 6.

Stem erect, 6–9 in., striate, slightly hairy, with many long branches; l. 1–$1\frac{1}{2}$ in., ovate, cuneate at base, acute, shallowly toothed or lobed, glabrous, or with a few minute stellate hairs,

thin, petiole nearly as long as l.; fl. on very slender, nodding, pubescent ped., leaf-opposed or in the forks of the branches; segm. short, triangular; cor. under ½ in. diam.; berry ⅓ in., inflated cal. nearly globose, ⅓ in. diam., pointed with the connivent segm., membranous, reticulated.

Low country, in waste and cultivated ground, very common. Fl. Feb., March; pale yellow.

Throughout the Tropics of the Old World.

This weed looks like an introduction to Ceylon, but does not seem to be American.

P. angulata, L., is also an occasional weed in cultivated ground. It is Fl. Zeyl. n. 97, and there are specimens in Herb. Hermann and C. P. 1898; but it is probably introduced.

P. peruviana, L., is the 'Cape Gooseberry' of the English; a native of Trop. America. Not uncommon in waste ground about Nuwara Eliya and elsewhere in the montane zone, especially in Haputale. The fruit is not much appreciated here.

3. **WITHANIA,** *Pauq.*

Perennial herb, l. alt. but often in unequal pairs, fl. in sessile, axillary, umbellate cymes; cal. campanulate, much enlarged and inflated in fruit, segm. 5, long; cor. campanulate, lobes 5, valvate; stam. 5, inserted at base of cor.-tube, exserted; ov. 2-celled, with numerous ovules, stigma globose; fruit a small berry, enclosed in the loose inflated cal., 1-celled; seeds numerous, compressed, faintly reticulate, embryo curved round endosperm.—Sp. 4; 2 in *Fl. B. Ind.*

***W. somnifera,** *Dun. in DC. Prod.* xiii. 1, 542 (1852). **Amukkara,** *S.* **Amukkiray,** *T.*

Herm. Mus. 58. Burm. Thes. 10. Fl. Zeyl. n. 96. *Physalis somnifera*, L. Sp. Pl. 182. *P. flexuosa*, L., Moon Cat. 15. Thw. Enum. 217. C. P. 3651.

Fl. B. Ind. iv. 239. Wight, Ic. t. 853.

Often semi-shrubby at base, root long, tapering, stems branched, covered with fine mealy stellate pubescence; l. 2–3½ in., ovate, suddenly tapering to base, subacute, entire, shining and apparently glabrous, but really with minute stellate or scaly hair, rather thick, veins pellucid; fl. rather small, on short pubescent ped., usually about 5 in umbellate cyme; cal. stellate-pubescent, segm. linear-triangular, recurved at apex; cor. ½ in. long, lobes lanceolate, erect, but recurved in upper part, pubescent outside; ov. glabrous, style as long as stam.; berry ¼ in. diam., fruiting cal. over ½ in., globose, slightly 5-angled, pointed with connivent segm., scurfy-pubescent.

A weed in cultivated ground; common, but very often cultivated. Fl. all the year; pale green.

Also in North-West India, the Mediterranean region and temperate South Africa.

The roots are a favourite medicine, especially among the Tamils.

There is neither specimen nor figure of this in Herb. Hermann, though included in Fl. Zeyl.

Capsicum minimum, Roxb., is commonly met with in shady places in the low country. It produces the small chillies known as *Nayi-miris* by the Sinhalese, and 'Bird Pepper' by the English. Its native county is doubtful.

Nicandra physaloides, Gaertn., a pretty blue-flowered Peruvian herb, is occasionally found as a roadside weed in the montane zone, having escaped from cultivation.

4. **DATURA**, *L.*

Annual herb, l. alt., fl. large, solitary; cal. tubular, segm. 5; cor. tubular-funnel-shaped, limb recurved, lobes 5, scarcely marked, plicate and contorted in bud; stam. 5, fil. adnate to cor.-tube from base half way up, anth. linear, dehiscing vertically, ov. 2-celled, style very long, stigma 2-lobed; fruit a fleshy prickly capsule, 2- or 4-celled, irregularly dehiscent; seeds numerous, compressed, embryo curved round central endosperm.—Sp. 10; 3 in *Fl. B. Ind.*

D. fastuosa, *L. Syst. Nat. ed.* 10, 932 (1759). **Attana,** *S.* **Veṇúmattai,** *T.*

Herm. Mus. 41, 69. Burm. Thes. 221. Fl. Zeyl. n. 86. *D. Metel*, L. Sp. Pl. 179. Moon Cat. 15. Thw. Enum. 217. C. P. 1897.
Fl. B. Ind. iv. 242. Wight, Ic. t. 1396.

Stem 1–2 ft. high, stout, somewhat zigzag, rather succulent, polished and shining but slightly rough with very minute scattered hairs, divaricately branched, marked with scars of fallen l.; l. 3–6 in., triangular-ovate, rounded and generally very unequal-sided at base, acute, entire, or more often with a few large coarse acute teeth or lobes, apparently glabrous but with a very minute mealy pubescence on both sides, dull glaucous green above, paler beneath, veins pellucid, petiole 1–2 in.; fl. very large, on very short stout ped. from the node but not axillary, erect; cal. 3 in., very minutely adpressed-pubescent, segm. ½ in., triangular, acuminate, acute; cor.-tube over 7 in., gradually widening upwards, limb 4 in. diam., lobes with the plait or midrib terminating in a short, linear, acute tail, pubescent on back; stam. about as long as cor.-tube, anth. nearly ¾ in.; ov. papillose, style over 6 in.; capsule nodding on curved ped., 1½ in., supported at base on reflexed

base of cal., fleshy, green, covered with numerous, scattered, short, straight, sharp prickles; seeds very numerous, closely packed, nearly smooth, pale brown.

Waste and cultivated ground; a common weed. Fl. Jan.–March; white or (rarely) purple.

Tropics generally.

Linnæus referred the Indian and Ceylon plant to his *D. Metel*, but the two species are scarcely separable. The leaves have a peculiar smoky odour when bruised. The leaves and seeds are included as official drugs in the Indian Pharmacopœia; they are sedative and narcotic, and the latter are often used as poison.

D. Stramonium, L., the Thorn Apple, is occasionally found as a road-side weed about villages in the montane zone.

D. suaveolens, H. & B. (*Brugmansia suaveolens*, G. Don.), the well-known and beautiful 'Trumpet-flower' of the English, *Rata-attana*, *S.*, is very commonly planted as a hedge about cottages, coolie lines and native gardens. It is a native of Mexico.

XCII.—SCROPHULARIACEÆ.

Annual or perennial herbs (rarely root parasites), l. usually opp., sometimes alt. or whorled, no stip.; fl. bisexual, usually irregular, in racemes or spikes; cal. free, sep. 5, rarely 4, connate or distinct (very rarely spathaceous); cor. 5- or 4-lobed, usually 2-lipped, lobes imbricate; stam. 4, didynamous (2 sometimes rudimentary staminodes) or 2, anth.-cells distinct (rarely confluent or one barren); ov. superior, 2-celled, ovules numerous in each cell, style simple, stigma usually 2-lobed or 2-bladed; fruit a 2-valved capsule; seeds small, numerous with fleshy endosperm.

Of our 40 species, the majority are common annual weeds growing in the mud or in the water of the paddy fields of the low country. Confined to the wet region are the species of *Adenosma*, *Centranthera*, and *Microcarpæa;* to the dry region, *Striga orobanchoides* and *Peplidium*. Only 6 species extend into the montane zone, but *Torenia hirtella*, *Sopubia trifida*, and *Pedicularis* are restricted to it. *Adenosma camphoratum* is endemic.

Two upper lobes of cor. outside in bud.
  Stam. 4, not didynamous; l. alt. (*Verbasceæ*) . 1. Celsia.
  Stam. 4, didynamous or 2; l. opp. or whorled (*Antirrhineæ*).
    Stam. 4.
      Sep. combined into a tubular cal. . . 7. Torenia.

Sep. distinct (sometimes connate in 8).
Anth.-cells confluent . . . . . 6. ARTANEMA.
Anth.-cells distinct.
One anth.-cell barren . . . . . 2. ADENOSMA.
Both anth.-cells perfect.
Fil. of stam. not appendaged.
Sep. equal . . . . . . 3. LIMNOPHILA.
Sep. very unequal . . . . . 4. HERPESTIS.
Fil. of longer stam. appendaged at base 8. VANDELLIA.
Stam. 2.
With 2 staminodes.
Sep. distinct.
L. parallel-veined . . . . . . 9. ILYSANTHES.
L. penniveined or veinless . . . 10. BONNAYA.
Sep. connate . . . . 5. DOPATRIUM.
Without staminodes.
Anth.-cells confluent; l. linear . . . 11. MICROCARPÆA.
Anth. 1-celled; l. spathulate . . . 12. PEPLIDIUM.
Two upper lobes of cor. inside in bud; stam. 4; l. often alt. (*Rhinantheæ*).
Anth. 1-celled . . . . 13. STRIGA.
Anth. 2-celled.
Cal. campanulate . . . . 14. SOPUBIA.
Cal. spathaceous.
Cor.-lobes nearly equal. . . . . . 15. CENTRANTHERA.
Cor. strongly 2-lipped . . . . . 16. PEDICULARIS.

1. CELSIA, *L.*

Annual, l. alt., fl. in terminal racemes; cal. segm. 5, deep; cor. rotate, lobes 5 (rarely 4) nearly equal, the 2 upper outside in bud; stam 4, fil. equal (not didynamous), anth. not connate, cells confluent; stigma slightly bilobed; capsule globose, seeds numerous, strongly worted.—Sp. 30; 1 in *Fl. B. Ind.*

C. coromandeliana, *Vahl, Symb. Bot.* iii. 79 (1794).
Thw. Enum. 217. C. P. 2021.
Fl. B. Ind. iv. 251. Wight, Ic. t. 1406.

Stem 2–3 ft., stout, hairy, branched at summit; radical l. on long petioles, compound or pinnatisect with several small lflts. or segm. at base and a large oblong-oval acute terminal one, cauline l. alt., sessile, oblong-ovate, passing into bracts, all coarsely dentate, hairy on both sides; fl. moderate-sized, on slender glandular-pubescent ped., in long erect narrow racemes terminating stem and branches; bracts leafy; cal.-segm. oblong, acute, glandular-pubescent; cor. $\frac{1}{2}$ in. diam., lobes rounded; fil. hairy; capsule $\frac{1}{3}$ in.

Dry region; very rare. I have only seen the C. P. specimens which were collected by Gardner in the island of Delft (Neduntivu). Fl. yellow.

Throughout India, and in Burma, Afghanistan, and China.

Verbascum Thapsus, L., the common English Mullein, is thoroughly naturalised about Nuwara Eliya, where it is abundant.

Calceolaria chelidonioides, H. B. K., a delicate flaccid annual, is a very common weed in the higher montane regions; it is a native of the Mexican mountains.

[*Linaria ramosissima*, Wall., is given for Ceylon in Fl. B. Ind. iv. 251, on the faith of a specimen from Walker in Herb. Kew, which was, no doubt, from N. W. India.]

[*Lindenbergia urticæfolia*, Lehm., given in Thw. Enum. 218, is not that plant, but *Adenosma subrepens*, Benth.]

2. ADENOSMA, *Br.*

Annual, l. opp., sometimes whorled, fl. axillary, racemose or capitulate, bractlets narrow; sep. 5, distinct, upper one largest, enlarged in fruit; cor. 2-lipped, upper lip erect, lower spreading, 3-lobed; stam. 4, didynamous, included, anth.-cells distinct, stalked, one usually barren; style exserted, much dilated and winged below stigma; capsule 4-valved.—Sp. 8; all in *Fl. B. Ind.*

Fl. racemose or axillary.
  Fl. purple . . . . 1. A. SUBREPENS.
  Fl. yellow . . . . 2. A. CAMPHORATUM.
Fl. in dense terminal heads . . . 3. A. CAPITATUM.

1. **A. subrepens,** *Benth. ex Fl. B. Ind.* iv. 263 (1884).

Lindenbergia urticæfolia, Thw. Enum. 218 (non Lehm.). *Pterostigma subrepens*, Thw. Enum. 426. C. P. 3821.

Fl. B. Ind. iv. 263.

Stem decumbent at base and rooting at nodes, ascending, rather stout, quadrangular, villous-hairy; l. $\frac{3}{4}$–$1\frac{1}{4}$ in., broadly ovate, obtuse, very coarsely crenate, slightly villous-hairy, becoming glabrous above, petiole $\frac{1}{4}$ in., densely villous; fl. very shortly stalked, solitary, axillary, bractlets filiform, shorter than sep.; 3 outer sep. ovate, acute, reticulate-veined, slightly hairy, 2 inner linear-lanceolate, glabrous; capsule broadly ovate-ovoid, pointed.

Moist low country; very rare. Hewesse, on borders of paddy fields. Fl. August; pale bluish-purple.

Endemic.

Dries blackish.

2. **A. camphoratum,** *Hk. f., Fl. B. Ind.* iv. 264 (1884). **Kahagona-kola,** *S.*

Herm. Mus. 1. Burm. Thes. 157. Fl. Zeyl. n. 412 (*Stæchado-mentha*). *Stemodia camphorata*, Vahl, Symb. Bot. ii. 69. *S. lutea*, Moon Cat. 45. *Pterostigma villosum*, Benth., Thw. Enum. 218. C. P. 2041.

Fl. B. Ind. iv. 264.

Stem 2–3 ft., bluntly quadrangular, glandular-hairy, with long branches ; l. 2–3 in., passing into bracts above, oval- or ovate-lanceolate, tapering to both ends, acute, coarsely crenate-serrate, slightly glandular-hairy above, more so beneath, petiole short, obscure ; fl. rather large, on slender glandular-hairy ped., solitary, axillary, forming long lax terminal racemes leafy below, bractlets linear, rather shorter than sep. ; sep. linear, subacute, with long glandular hair, the uppermost broader and longer ; upper lip of cor. entire, lobes of lower lip lanceolate, acute ; capsule ¼ in. (half as long as sep.) pointed.

Moist low country below 2000 ft.; in wet places, rather common. Fl. March–May; bright yellow.

Endemic.

The whole plant dries black. Foliage very aromatic when bruised, but scarcely camphoraceous.

3. **A. capitatum,** *Benth. ex Fl. B. Ind.* iv. 264 (1884). **Nil-gona-kola,** *S.*

Stemodia camphorata, Moon Cat. 45 (non Vahl). *Pterostigma capitatum*, Benth., Thw. Enum. 218. C. P. 2880.

Fl. B. Ind. iv. 264.

Stem 9–18 in., erect, very stout, cylindrical, densely villous-hairy, with numerous slender whorled ascending branches ; l. usually in whorls of 4, sessile, lanceolate-oblong, obtuse or subacute, crenate-serrate, villous-hairy on both sides, copiously gland-dotted beneath ; fl. small, sessile, whorled in axils of leafy bracts, densely aggregated into short, rounded or ovoid, terminal heads ½–¾ in. long, bractlets filiform, as long as sep. ; sep. linear, equal in length, acute, very hairy ; capsule shorter than sep., globose, acuminate.

Moist low country below 1000 ft.; rather common. About Colombo, abundant in the Cinnamon Gardens; Pasdun Korale. Fl. Nov.; bluish-purple.

Also in India, Burma, Malaya, China.

Very aromatic; the leaves are chewed with betel. Very like a Labiate in appearance.

Stemodia parviflora, Ait., a small annual from Trop. America, has occurred as a weed in Dolosbagie District.

3. **LIMNOPHILA,** *Br.*

Annual, aquatic, l. opp. or whorled, copiously gland-dotted, the lower often pectinately cut, fl. axillary, racemose or spicate, with or without bractlets ; sep. 5, equal ; upper lip of cor. faintly bilobed, lower 3-lobed ; stam. 4, didynamous,

included, anth. cohering in pairs, cells distinct, both perfect; style exserted, decurved at end, stigma of 2 blades; capsule 2-valved, usually loculicidal, enclosed in cal.—Sp. 25; 23 in *Fl. B. Ind.*

Leaves pinnately veined, none pectinate.
 Fl. sessile . . . . 1. L. CONFERTA.
 Fl. on pedicels.
  Stem. glabrous . . . . . . 2. L. GRATISSIMA.
  Stem. hairy . . . . . . 3. L. HIRSUTA.
Upper l. with parallel veins, lower pectinate.
 Fl. sessile.
  Sep. long, acuminate. . . . 4. L. SESSILIFLORA.
  Sep. short, acute . . . . 5. L. HETEROPHYLLA.
 Fl. on pedicels . . . . . . 6. L. RACEMOSA.
Upper l. 1-veined, but often all divided . 7. L. GRATIOLOIDES.

1. **L. conferta,** *Benth. in DC. Prod.* x. 387 (1846). **Amba-wila,** *S.*
L. serrata, Thw. Enum. 218 (? Gaudich.). C. P. 2049.
Fl. B. Ind. iv. 266.

Stem stout, spongy, prostrate or floating below, with long roots from the nodes, cylindrical, glabrous or hairy; l. sessile, $\frac{3}{4}$–1 in., with a broad base, rhomboid-lanceolate, obtuse, crenate-serrate, rather thick, glabrous, dull pale green; fl. sessile, solitary or in very short leafy axillary spikes, bractlets minute, linear; sep. linear, very acute, usually hairy, tips spreading; cor. $\frac{3}{8}$ in., pubescent outside, tube wide, lobes short, rounded; capsule $\frac{1}{6}$ in., seeds bluntly angular, shining.

Wet places in the low country; common. Fl. Jan.–March, June; pale violet-pink.

Also in Peninsular India, E. Bengal, and Burma.

A very variable plant in habit; when prostrate and stunted it is *L. repens*, Benth.

The leaves have a very strong camphoraceous odour and taste; hence the plant is sometimes called 'Kapura' by the Sinhalese, and chewed by them with Betel.

2. **L. gratissima,** *Bl. Bijdr.* 750 (1826).
L. punctata, Bl., Thw. Enum. 218. C. P. 2035, 535.
Fl. B. Ind. iv. 268. Rheede, Hort. Malab. x. t. 6.

Stem decumbent at base, copiously rooting at nodes, then erect, 12–15 in., very stout, spongy or inflated, cylindrical, glabrous; l. in whorls of 3, sessile and rather amplexicaul, $1\frac{1}{4}$–$1\frac{3}{4}$ in., lanceolate-oblong, acute, sharply serrate, glabrous; fl. on long slender glandular ped., solitary or (by the l. passing into bracts) forming racemes, bractlets minute, linear; sep. linear-lanceolate, acute, finely glandular-pubescent; cor. over $\frac{1}{2}$ in., pubescent outside, lobes nearly equal, short, rounded; capsule ovate-ovoid, smooth; seeds with truncate ends.

Wet places in the low country; common. Fl. April–September; mauve-pink.

In most parts of Trop. Asia and Australia.

Rather variable. C. P. 535 is the form with solitary axillary flowers, *L. punctata*, Bl. Leaves slightly aromatic when bruised, and hot to the taste.

3. **L. hirsuta,** *Benth. in DC. Prod.* x. 388 (1846).
Thw. Enum. 218. C. P. 2040.
Fl. B. Ind. iv. 268.

Stem stout, rather spongy, rooting at nodes below, villous-hairy; l. opp. or often in whorls of 3, sessile, about 1 in., lanceolate, acute or subacute, finely serrate, slightly hairy; fl. on slender hairy ped., rather large, solitary or forming short axillary racemes; sep. very acute, hairy; cor. $\frac{1}{2}$ in., glabrous.

Wet places and paddy fields in the low country; rather common. Fl. April–Sept.; violet-pink.

Also in S. India, E. Bengal, Burma, Borneo, China.

L. laxa, Benth., is given for Ceylon (Walker) in Fl. B. Ind. iv. 267. I am unable to distinguish it from *L. hirsuta.*

4. **L. sessiliflora,** *Bl. Bijd.* 750 (1826).
Thw. Enum. 218 (in part). C. P. 2037, 2389 (part).
Fl. B. Ind. iv. 270.

Stem submerged, rooting at lower nodes, cylindrical, branched, glabrous; l. sessile, the uppermost often undivided, narrowly lanceolate, acute, finely serrate, 3-nerved, the rest cut to the base into numerous tufted, filiform, pectinate, spreading or deflexed, whorled segm.; fl. sessile, axillary; sep. ovate-lanceolate, long-acuminate, very acute.

In wet places and paddy fields in the low country; common. Fl. July; pink.

Also in India, Burma, Java, Japan.

According to Fl. B. Ind., a Ceylon plant called by Bentham *L. gratioloides*, var. *myriophylloides*, with short rigid leaf-segments, is a land form of this growing on mud. The pectinate leaves are very much like those of *Myriophyllum.*

5. **L. heterophylla,** *Benth. in DC. Prod.* x. 390 (1846).
L. sessiliflora, Thw. Enum. 218 (part). C. P. 2389 (part).
Fl. B. Ind. iv. 270.

Creeping on mud or floating on water, much rooting at lower nodes, stem cylindrical, spongy, glabrous, branched below; l. sessile, the uppermost $\frac{1}{2}$–$\frac{3}{4}$ in., acute, finely serrate, 3-nerved, glabrous, intermediate l. cut nearly to base into 3 or 5 lanceolate segm., lowest ones (generally submerged) closely placed, cut to the base into numerous (9–11) filiform pectinate, whorled segm.; fl. sessile, in axils of upper l.; sep.

short, narrowly oval, acute, semi-membranous, not ribbed; capsule ovate-ovoid.

Wet places and paddy fields in the low country; common. Fl. June, July; pink.

Also in India, Borneo, Japan, China.

Apparently connected by intermediates with *L. sessiliflora*, and scarcely a separate species; but the form of the sep. differs.

6. **L. racemosa,** *Benth., Scroph. Ind.* 26 (1835).

Diceros aquaticus, Moon Cat. 45. Thw. Enum. 218. C. P. 2036, 2996.

Fl. B. Ind. iv. 271. Wight, Ic. t. 861 (not good). Roxb. Cor. Pl. t. 189 (*Cyrilla aquatica*).

Stem long, erect, mostly submerged, thick and inflated, cylindrical, shaggy, with long hair; l. sessile, the upper ones large, 2–3 in., oblong-lanceolate, amplexicaul and somewhat rounded at base, subacute, finely spinous-serrate, glabrous, strongly 3- or 5-nerved, lower ones (submerged) closely placed, deeply cut into many pectinate segm., often deflexed and root-like; fl. large, on slender glandular-hairy or glabrous ped., numerous, in long erect (occasionally branched) racemes, bracts ovate, acute, bractlets none; sep. ovate, long-acuminate, glabrous or slightly glandular-pubescent; cor. $\frac{5}{8}$ in., lobes of upper lip short, rounded, of lower lip ovate, acute; capsule globose, shorter than cal.

In ponds in the low country; rather common below 1000 ft. Fl. July–Sept.; pale violet, tube yellow.

A beautiful plant when in flower, and well grown in deep water.

7. **L. gratioloides,** *Br. Prodr.* 442 (1810).

Burm. Thes. 121. *Hottonia indica*, L. Syst. Nat. ed. 10, 919.; Moon Cat. 13. *Gratiola trifida*, Willd., Moon Cat. 4. *Hydropityon zeylanicum*, Gaertn. f., Carp. Suppl. 20. *L. myriophylloides*, Roth, Nov. Sp. Pl. 294. Thw. Enum. 218. C. P. 2038.

Fl. B. Ind. iv. 271. Burm. Thes. Zeyl. t. 55, f. 1.

Small, usually under 6 in., stem slender, rooting at lower nodes, usually much branched from the base, sub-quadrangular, glabrous; l. usually all cut to base into 3 narrow pinnatifid segm., but the uppermost often oblong, coarsely serrate, 1-nerved and the lowest sometimes multifid and pectinate; fl. small on divaricate ped. longer than l., axillary or racemose; sep. ovate-lanceolate, acute, slightly glandular-hairy; capsule globose, as long as sep.

On mud, in the dry region; rather common. Puttalam; Anuradhapura; Trincomalie; Uma-oya. Fl. March, April; pink.

Throughout the Tropics of the Old World.

Has a strong aromatic scent.

4. **HERPESTIS,** *Gaertn. f.*

Annual, l. opp., sometimes gland-dotted, fl. axillary, with bractlets; sep. 5, unequal, much imbricated, outer much the larger; cor. faintly 2-lipped, lobes nearly equal; stam. 4, didynamous, included, anth.-cells distinct, both perfect; capsule enclosed in cal.—Sp. 50; 3 in *Fl. B. Ind.*

Stem prostrate, l. spathulate . . . 1. H. MONNIERIA.
Stem erect, l. linear-lanceolate . . . 2. H. FLORIBUNDA.

1. **H. Monnieria,** *H. B. K. Nov. Gen. & Sp.* ii. 366 (1817). **Lunu-wila,** *S.*

Gratiola Monnieria, L., Moon Cat. 4. Thw. Enum. 218. C. P. 2034. Fl. B. Ind. iv. 272. Roxb. Cor. Pl. t. 178. Bot. Mag. t. 2557.

Stems creeping, rooting at the nodes, glabrous, rather succulent, with numerous ascending branches; l. numerous, sessile, $\frac{1}{2}$–$\frac{3}{4}$ in., spathulate, very obtuse, entire, glabrous, rather fleshy; fl. solitary, axillary, on glabrous ped., much longer than l., bractlets linear-lanceolate; outer sep. oval-oblong, acute; cor. nearly $\frac{1}{2}$ in. long, rounded; capsule ovoid, sharply pointed.

Marshy places in the low country; very common, especially near the coast. Fl. Dec.; pale violet-blue.

Throughout the Tropics.

Employed as a mild purgative in fevers.

2. **H. floribunda,** *Br. Prodr.* 442 (1810).

Benth. in DC. Prod. x. 400. Thw. Enum. 218. C. P. 2881. Fl. B. Ind. iv. 273.

Stem erect, 4–12 in., sub-quadrangular, glabrous, slightly branched at base; l. $\frac{3}{4}$–$1\frac{1}{4}$ in., lanceolate-linear, acute, entire, narrowly revolute at margin, finely gland-dotted; fl. 1 or 2 in an axil, on short slender ped., bractlets filiform, sep. membranous, veiny, puberulous, outer ones broadly oval, obtuse.

Wet places in low country; rare. Kalutara (Moon); Colombo (Ferguson); Trincomalie (Glenie).

Also in S. India, Java, Australia, Trop. Africa.

I have not met with this plant.

5. **DOPATRIUM,** *Hamilt.*

Erect, slender, aquatic annuals, l. mostly radical, fl. axillary or racemose, without bractlets; sep. 5, usually connate below into a cal., equal; cor.-tube widened at throat, upper lip slightly bifid, lower deeply 3-lobed; stam. 2 (upper pair) included, anth.-cells distinct, staminodes (lower stam.) 2, minute; style

short, stigma dilated with 2 blades; capsule small, globose, loculicidal, seeds finely tubercled.—Sp. 5; 3 in *Fl. B. Ind.*

Fl. about ½ in., showy.
 Cal.-segm. linear, very acute . . . 1. D. NUDICAULE.
 Cal.-segm. oval, obtuse . . . . 2. D. LOBELIOIDES.
Fl. about ⅙ in., inconspicuous . . . 3. D. JUNCEUM.

1. **D. nudicaule,** *Ham. in Benth. Scroph. Ind.* 31 (1835).
Thw. Enum. 218. Benth. in DC. Prod. x. 407. C. P. 2046.
Fl. B. Ind. iv. 274.

Stem 6–10 in., simple or with long erect branches from base, slender, glabrous; l. sessile, in 2 or 3 pairs crowded at the base of stem, under ½ in., oval-oblong, subacute, amplexicaul, and two or three distant pairs on the stem, small, adpressed, bract-like; fl. few, solitary, on long erect ped. extending beyond the stem; cal.-segm. linear, very acute; cor. ⅜ in. diam., lobes truncate, erose, upper lip scarcely bilobed.

Wet places and paddy fields in the low country; common. Fl. June, July, December; brilliant purple-blue, veined with darker purple.
Also in S. India, Java, and Philippine Islands.
Gives off the scent of Coumarin when drying.

2. **D. lobelioides,** *Benth. Scroph. Ind.* 31 (1835).
Benth. in DC. Prod. x. 407. *Gratiola lobelioides*, Retz., Moon Cat. 3. Thw. Enum. 219. C. P. 2042.
Fl. B. Ind. iv. 274. Wight, Ic. t. 859.

Stem 9–18 in., branched, spongy, thickened below, glabrous; l. few, sessile, mostly crowded at base, lowest ones nearly 3 in., lanceolate-oblong, acute, stem-l. much smaller, passing into bracts; fl. numerous, large, on long filiform divaricate ped. in elongated racemes; sep. nearly distinct, oval, obtuse; cor. ½ in. long, upper lip scarcely bilobed, lobes of lower lip deep, oblong, obtuse; capsule shorter than cal.

Paddy fields and wet places; common, especially in the dry region. Fl. July; bright pale purplish-blue.
Also in S. India.
A handsome water-plant.

3. **D. junceum,** *Ham. in Benth. Scroph. Ind.* 31 (1835). **Binsawan,** *S.* (Moon).
Gratiola juncea, Roxb., Moon Cat. 4. Thw. Enum. 219. C. P. 2044.
Fl. B. Ind. iv. 274. Roxb. Cor. Pl. t. 129 (*Gratiola juncea*).

Stem 9–15 in., usually much branched at base, lower part of stem much swollen and spongy, upper portion very slender; l. few, sessile, oblong or oblong-oval, rather thick, glabrous, lower ones ½–⅝ in., upper ones distant, much smaller, passing

into bracts; fl. very small, solitary, on rather short very slender ped. or nearly sessile; cal. campanulate, segm. deep, oval, obtuse; cor. $\frac{1}{6}$ in. long, upper lip distinctly bilobed, all lobes short, rounded; capsule very small, globose.

Wet places in the low country; very common. Fl. June, July; pale pinkish-violet.

Throughout the Eastern Tropics.

6. **ARTANEMA,** *Don.*

Herbaceous, l. opp., fl. large, without bractlets, in terminal racemes; sep. 5, strongly imbricate; cor-tube funnel-shaped, dilated at mouth, upper lip erect, lobed, lower lip with 3 broad lobes; stam. 4, didynamous, anth. coherent in pairs, cells confluent, fil. of anterior ones long, curved round mouth of cor.-tube, dilated at base into prominent knobs; stigma of 2 blades; capsule globose; seeds lobulated.—Sp. 4; 2 in *Fl. B. Ind.*

A. sesamoides, *Benth. Scroph. Ind.* 39 (1835). **Gas-kotala,** S.
Diceros longifolius, Pers., Moon Cat. 45. Benth. in DC. Prod. x. 408. Thw. Enum. 219. C. P. 2024.
Fl. B. Ind. iv. 274. Wight, Ic. t. 1410.

A stout herb, stem 2–3 ft., erect, branched, quadrangular with very acute angles, glabrous, often purple; l. sessile, $2\frac{1}{2}$–5 in., narrowly ovate-lanceolate, tapering at base, acuminate, very acute, serrate, harsh on both sides and at margin with fine asperities; fl. large, on short ped., in long erect, lax, terminal racemes; sep. ovate, acute, nearly glabrous; cor. nearly 1 in., glandular-pubescent inside and out, lobes rounded, obtuse.

Open places and waste ground up to 4000 ft., rather common. Fl. July, August; rather dull violet-purple.

Also in S. India, Malaya, Philippine Is., and Trop. Africa (?).
Sometimes cultivated in gardens.

7. **TORENIA,** *L.*

Herbs, stem quadrangular, l. opp., fl. rather large, axillary; sep. completely connate into a tubular, angular or winged, 2-lipped, 3–5 toothed cal.; cor.-tube tubular, dilated above, upper lip slightly notched, concave, lower lip broadly 3-lobed; stam. 4, didynamous, longer fil. arched, toothed at base, anth. coherent in pairs, perfect, cells of the upper pair divaricate,

distinct, of the lower pair often confluent; capsule linear-oblong, included in cal.-tube, 2-valved.—Sp. 20; 11 in *Fl. B. Ind.*

Ped. over 1½ in., cor. 1 in. . . . . 1. T. ASIATICA.
Ped. under 1½ in., cor. ½ in. . . . . 2. T. HIRTELLA.

1. **T. asiatica,** *L. Sp. Pl.* 619 (1753). **Kotala-wel,** *S.*
Moon Cat. 45. Thw. Enum. 219. C. P. 2032.
Fl. B. Ind. iv. 277. Wight, Ic. t. 862. Bot. Mag. t. 4249 and t. 5167 (*T. hirsuta*).

Stems creeping, rooting at nodes, glabrous, with many long straggling spreading or erect branches; l. ¾–1¼ in., ovate-lanceolate, rounded at base but tapering on the petiole, acute, serrate, slightly rough with short hair on both sides, petiole ¼–½ in.; fl. solitary, ped. erect or spreading glabrous, 1½–2 in. long, becoming thickened and deflexed in fruit; cal. near ¾ in., cut about half way down into 2 acute lips, glabrous, tube 5-ribbed, slightly winged; cor.-tube 1 in., limb nearly 1 in. diam., upper lip arched, nearly entire, lobes of lower lip broader than long; capsule about as long as cal.; seeds excavated.

Damp places in the moist region up to 4000 ft., common. Fl. Feb.–June; dark purple, tube pale yellow.

Also in S. India, Burma, Java, China.

The Fl. B. Ind. distinguishes our plant as var. *parvifolia.* It appears to have smaller leaves and flowers than the Continental form. The colouring of the flower also differs, ours having always a yellow tube.

2. **T. hirtella,** *Hk. f. in Fl. B. Ind.* iv. 277 (1884).
T. rubens, Thw. Enum. 219 (? Benth.). C. P. 2033.
Fl. B. Ind. iv. 277.

Stems very slender, slightly rooting at nodes, long, with nodes widely separated, slightly hairy (especially at nodes) or glabrous; l. ½–1 in., ovate-lanceolate, truncate at base, acute, coarsely serrate, sparsely hairy on both sides, petiole very short, ⅛–¼ in.; fl. on very slender slightly hairy ped. under 1½ in. long, deflexed in fruit; cal. under ½ in., glabrous, segm. partially distinct in each lip, tube not winged; cor. under 1 in., lower lip deeply 3-lobed, the middle one much the longest; appendages to the longer fil. large, curved, clavate, dark purple, exserted.

Upper montane zone, rare. About Nuwara Eliya, frequent. Fl. August, Sept.; pale blue and white.

Also in the Nilgiri Mountains.

Perhaps not more than a montane variety of *T. asiatica,* but readily distinguishable by the flowers.

8. VANDELLIA, *L.*

Annuals, stem quadrangular, l. opp., penniveined, fl. small, axillary rarely racemose; sep. 5, usually distinct, rarely connate into a cal.; upper lip of cor. concave, notched, lower lip broad, 3-lobed; stam. 4, didynamous, fil. of longer (anterior) pair arched, expanded at base into a knob or appendage, anth. connate in pairs, all perfect, cells distinct, approximate, divaricate; stigma with 2 blades; capsule septicidally 2-valved, placentas very large.—Sp. 30; 13 in *Fl. B. Ind.*

Sep. connate into a campanulate cal. . 1. V. CRUSTACEA.
Sep. distinct
  Fl. in axillary racemes . . . . 2. V. HIRSUTA.
  Fl. solitary
    Capsule rather shorter than sep. . 3. V. SCABRA.
    Capsule longer than sep.
      L. ovate . . . . . . 4. V. PEDUNCULATA.
      L. linear . . . . . . 5. V. ANGUSTIFOLIA.

1. **V. crustacea,** *Benth. Scroph. Ind.* 35 (1835).
Gratiola lucida, Vahl, Moon Cat. 4. Thw. Enum. 219. C. P. 2048.
Fl. B. Ind. iv. 279. Wight, Ic. t. 863.

Stems generally prostrate, rooting at the lower nodes, with very many long spreading branches, usually pubescent at the angles, l. numerous, usually under ½ in., ovate, subacute, coarsely but shallowly serrate, glabrous above, finely hispid on margin and veins beneath, petiole obvious; fl. axillary, solitary, ped. straight, usually exceeding l.; sep. connate into a campanulate 5-ribbed cal., segm. 5, short, triangular, acute; capsule oblong-ovoid, blunt, a little shorter than cal.

Damp places in the low country; very common; an inconspicuous weed. Fl. Nov., Dec.; pale purplish-pink.

Throughout the Tropics of the Old World.

There is a specimen in Hermann's Herb. not named or taken up by Linnæus.

2. **V. hirsuta,** *Ham. in Benth. Scroph. Ind.* 36 (1835).
V. multiflora, Thw. Enum. 219 (non G. Don). C. P. 3309.
Fl. B. Ind. iv. 280.

Stem short, erect, with many long branches from the base, densely covered with spreading hair; l. 1–2 in., oval, tapering into wide petiole (the upper ones nearly sessile), subacute, dentate-serrate, slightly hairy on both sides; fl. on long slender ped., in lax viscous-pubescent axillary racemes; sep.

distinct, linear-lanceolate, acuminate, hairy; capsule ovoid, shorter than cal.

Low country; very rare. Between Negombo and Kurunegala; Gattehatte. Fl. July–Sept.; pale violet.
Also in India, Burma, Java, Borneo, China, and Philippine Is.

3. **V. scabra,** *Benth. Scroph. Ind.* 36 (1835).
Thw. Enum. 219. C. P. 2885.
Fl. B. Ind. iv. 281.

Stems prostrate, with many erect or ascending divaricate branches, rooting at nodes, usually hispid with long hair; l. sessile, $\frac{3}{8}$–$\frac{1}{2}$ in., rotundate-ovate, obtuse, faintly serrate, more or less clothed with longish hairs, scabrous on margin; fl. on slender nearly glabrous ped. which are shorter than l. and usually deflexed in fruit, in clusters of 1–4; sep. linear-lanceolate, acute, with long spreading hairs; lobes of lower lip of cor. equal, rounded; capsule globose, a little shorter than sep.; seeds reticulated.

Moist places, especially paddy fields, in the low country; very common. Fl. July, Oct.–Feb.; very pale yellowish-pink, or nearly white, upper lip pale brown.
Tropics of the Old World.

4. **V. pedunculata,** *Benth. Scroph. Ind.* 37 (1835).
Gratiola cordifolia, Vahl, Moon Cat. 4. Benth. in DC. Prod. x. 417. Thw. Enum. 219. C. P. 652.
Fl. B. Ind. iv. 282.

Stems weak, usually prostrate and rooting below, then erect or ascending, 4–9 in., glabrous, much branched, often purple; l. sessile or nearly so, $\frac{1}{2}$ in., ovate, subcordate at base, subacute, crenate-serrate, glabrous; fl. solitary, axillary, ped. much longer than l., quadrangular, divaricate or reflexed in fruit; sep. linear-lanceolate, very acute; cor. nearly $\frac{1}{2}$ in., middle lobe of lower lip longest; capsule linear-oblong, twice as long as sep., tipped with persistent style.

Paddy fields and wet places in the low country; very common. Fl. July; pale violet, lower lobe with a yellow spot.
Also in India, Borneo, China.
Variable in habit. Bentham has (in DC. Prod. x. 417) a var. *parviflora* from Ceylon, but gives no characters.

5. **V. angustifolia,** *Benth. Scroph. Ind.* 37 (1835).
Thw. Enum. 219. C. P. 2884.
Fl. B. Ind. iv. 282.

Stem erect, attaining 1 ft., often much branched from base with long erect branches, glabrous; l. sessile, $\frac{3}{4}$–$1\frac{1}{2}$ in., linear, very faintly toothed or entire, obtuse, glabrous; fl. solitary on stiff ped. exceeding l.; sep. linear, subacute, glabrous; capsule

linear, over $\frac{1}{2}$ in., nearly 3 times as long as sep., tipped with style.

Wet places in the low country; rare (?). Kalutara (Moon); Colombo (Ferguson); Puttalam. Fl. Jan., Feb.; pinkish.

Also in E. Bengal, Burma, Sumatra, Java, China, Japan.

In dry sandy places this often becomes very dwarf.

9. **ILYSANTHES,** *Rafin.*

Annuals, stem quadrangular, l. opp., sessile, parallel-veined, dotted, fl. racemose or axillary, small; sep. 5, distinct, narrow; upper lip of cor. concave, notched, lower lip very broad, 3-lobed; stam. 2, fil. short, included, anth. connate, cells distinct, divaricate, staminodes (lower stam.) 2, long, exserted, bifid; stigma with 2 blades; capsule septicidally 2-valved.—Sp. 8; 4 in *Fl. B. Ind.*

L. lanceolate; capsule twice as long as sep. . . 1. I. HYSSOPIOIDES.
L. broadly oval; capsule as long as sep. . . 2. I. ROTUNDIFOLIA.

1. **I. hyssopioides,** *Benth. in DC. Prod.* x. 419 (1846).
Gratiola hyssopioides, L., Moon Cat. 4. Thw. Enum. 219. C. P. 2407 (part), 3111.
Fl. B. Ind. iv. 283. Wight, Ic. t. 857 (*Bonnaya hyssopioides*).

Stem erect, 3–12 in., slender, glabrous, simple or diffusely branched; l. sessile, under $\frac{1}{2}$ in., lanceolate, obtuse, very slightly serrate, glabrous, rather thick, 3-veined; fl. solitary, axillary, on long filiform spreading ped., deflexed in fruit; sep. linear, subacute, glabrous; cor.-tube wide, flattened, upper lip short, lower lip with the middle lobe broadest; stam. included in cor.-tube; staminodes hooked, decurrent on cor.-tube as glandular-hairy ridges; capsule twice as long as sep., oblong, acuminate.

Paddy fields, &c., in the low country, very common. Fl. Jan.–March, July; nearly white or pale blue, with dark-purple markings.

Also in the Indian Peninsula and China.

2. **I. rotundifolia,** *Benth. in DC. Prod.* x. 420 (1846).
Gratiola rotundifolia, L., Moon Cat. 4. *I. hyssopioides* (part), Thw. Enum. 219. C. P. 2407 (part).
Fl. B. Ind. iv. 284. Roxb. Pl. Cor. t. 204.

Stem creeping or diffuse, rooting at lower nodes, very slender, glabrous; l. $\frac{1}{4}$–$\frac{3}{8}$ in., broadly oval, obtuse, entire, glabrous, 3–5-veined; fl. solitary, axillary, ped. exceeding l.; sep. linear-lanceolate, acute; capsule globose, about as long as sep.

Wet places in the low country, rather rare. Bentota; Kandy. Fl. March; pale bluish-white.

Also in S. India, Madagascar, and Mauritius.

10. **BONNAYA,** *Link & Otto.*

Annuals, stem quadrangular, l. opp., sessile, obscurely veined; fl. axillary or in terminal racemes; sep. 5, narrow; upper lip of cor. nearly entire, lower deeply 3-lobed, the middle lobe the largest; stam. 2, fil. short, anth. connate, cells distinct, divaricate, staminodes (lower stam.) 2, curved, exserted; stigma with 2 blades; capsule linear, very narrow, twice as long as sep., septicidally 2-valved.—Sp. 8; 6 in *Fl. B. Ind.*

Scarcely differs from *Ilysanthes.*

L. strongly spinous-serrate, oblong .	1. B. BRACHIATA.
L. serrate, oval	2. B. VERONICÆFOLIA.
L. nearly entire, linear	3. B. TENUIFOLIA.

1. **B. brachiata,** *Link & Otto, Ic. Pl. Select.* i. 25 (1820). Thw. Enum. 426. C. P. 3084. Fl. B. Ind. iv. 284. Rheede, Hort. Malab. ix. t. 59.

Stem short, erect, with many wide-spreading branches from the base, glabrous or nearly so; l. lanceolate-oblong, obtuse, very strongly spinous-serrate, glabrous; fl. on short thick ped., in lax terminal racemes, bracts filiform-setaceous, longer than ped.; sep. linear, with setaceous points, staminodes short, pubescent; capsule divaricately spreading, acute.

Damp places, especially on rocks, in the dry and intermediate regions, rather common. Haragama; Nalande; Dambulla; Tissamaharama. Fl. July, Nov., Dec.; pale pink.

Also in India, Malaya, China, Philippine Is.

2. **B. veronicæfolia,** *Spreng. Syst. Veg.* i. 41 (1825). **Wila,** *S.* Herm. Mus. 17. Burm. Thes. 13. Fl Zeyl. n. 235. *Ruellia antipoda,* L. Sp. Pl. 635. *Gratiola veronicifolia,* Retz, Moon Cat. 3. *B. verbenæfolia,* Spr. Benth. DC. Prod. x. 421. Thw. Enum. 219. C. P. 2050, 2051. Fl. B. Ind. iv. 285. Wight, Ic. t. 1411.

Stems prostrate, much branched and densely or laxly tufted, copiously rooting at nodes, glabrous; l. $\frac{1}{2}$–$\frac{3}{4}$ in., oval or oblong-lanceolate, deeply and sharply serrate, glabrous, very minutely punctate, veins inconspicuous; fl. in terminal or leaf-opposed racemes, ped. stout, divaricate, lengthening in fruit, bracts linear, acute; sep. linear, acute, finely spinous-ciliate; cor. under $\frac{1}{2}$ in., staminodes long, clavate, exserted, yellow.

Damp ground in the low country, a weed, very common. Fl. Dec.–March, July; pale violet.

Throughout Tropical Asia.

Variable in habit and inflorescence. Hermann gives 'Hiramana' as the Sinhalese name for this.

3. **B. tenuifolia,** *Spreng. Syst.* i. 42 (1825).
Gratiola tenuifolia, Vahl, Enum. i. 96; Moon Cat. 4. Thw. Enum. 220. C. P. 2883.
Fl. B. Ind. iv. 286.

Stem erect, 4–6 in., with erect branches from the base, glabrous; l. 1–1½ in., linear or linear-lanceolate, entire or very slightly toothed; fl. on rather long deflexed ped., axillary; sep. linear, acute.

Sandy damp places in the low country, rare (?). Peradeniya (Thwaites); Kalutara (Macrae).

Also in India, Burma, and China.

I do not know this species, of which there are very indifferent specimens in Herb. Perad. It seems to be very close to *Vandellia angustifolia* and *Ilysanthes hyssopioides*, and is probably often confounded with them.

11. MICROCARPÆA, *Br.*

Minute annual, l. opp., sessile, oblong, fl. minute, axillary, without bractlets; cal. tubular, segm. 5; cor.-tube short and broad, lobes 5, two upper slightly connate; stam. 2, anth.-cells confluent, no staminodes; stigma not 2-bladed; capsule loculicidally 2-valved.—Monotypic.

M. muscosa, *Br. Prodr.* 436 (1810).
Thw. Enum. 220. Benth. in DC. Prod. x. 433. C. P. 2728.
Fl. B. Ind. iv. 287.

Stems very slender, filiform, creeping, rooting at nodes, much branched and matted, quadrangular, glabrous; l. very small, under $\frac{1}{6}$ in., oblong-linear, obtuse, glabrous; fl. solitary, sessile; cal.-tube 5-ribbed, glabrous, segm. short, acute, slightly ciliate, spreading.

Creeping on mud, in moist low country, rather common. Kitulgala; Bentota; Kalutara; Ambagamuwa. Fl. March–May.

Also in India, Burma, Java, China, Australia.

A minute herb with the habit of *Callitriche stagnalis*.

12. PEPLIDIUM, *Del.*

Small annual, l. opp., spathulate, fl. axillary; cal. tubular, enlarged in fruit, segm. 5, short; cor.-tube short and broad, lobes 5, lowest the widest; stam. 2, fil. curved, anth. 1-celled, no staminodes; stigma large, flat, tongue-shaped, curved; capsule globose, bursting irregularly.—Sp. 2; 1 in *Fl. B. Ind.*

P. humifusum, *Del. Fl. Ægypt.* 148 (1813).
Thw. Enum. 426. C. P. 3789.
Fl. B. Ind. iv. 287. Hook. Bot. Misc. iii. t. Supp. 29 (*Microcarpæa cochlearifolia*).

Stems elongated, filiform, rooting at nodes, often submerged or floating, flexuose, much branched; l. under ½ in., obscurely stalked, spathulate, rounded at apex, tapering at base, rather fleshy, sometimes floating, glabrous, minutely punctate; fl. small, on very short ped., 1–3 together; cal.-segm. very short, tooth-like, obtuse; capsule ⅛ in., enclosed in enlarged membranous cal.

In water of shallow ponds in the dry region, rare. Trincomalie (Glenie); Mannar Dist. Fl. Jan., Feb.; pinkish-white.
Also in S. India, Egypt, and Australia.
The filiform stems root at long intervals, the terminal leaves float on the surface of the water just as in *Callitriche verna.*

Glossostigma spathulatum, Arn., is recorded from 'Ceylon, Gardner,' in Fl. B. Ind. iv. 288. I have seen no specimens.

Scoparia dulcis, L., a Tropical American plant, is a common weed by roadsides in the south of the Island. It is a recent introduction, and was first noticed about Galle in 1871 by Ferguson. It is C. P. 4014.

Veronica polita, Fries, a common plant in temperate countries, occurs as a weed in cultivated ground at Nuwara Eliya.

13. STRIGA, *Lour.*

Erect herbs, parasitic (? always) on roots, l. (sometimes reduced to scales) alt. or opp., fl. axillary, forming spikes, with bractlets; cal. campanulate or tubular, with 5, 10, or 15 strong ribs, segm. 5, acute; cor.-tube long, slender, curved or bent, exserted, lobes 5, unequal, spreading; stam. 4, didynamous, included, anth. not connate, 1-celled; stigma simple; capsule loculicidally 2-valved; seeds very numerous.—Sp. 18; 6 in *Fl. B. Ind.*

Leafless, l. reduced to scales . . . 1. S. OROBANCHOIDES.
With ordinary leaves.
  Cal. 10-nerved; fl. yellow . . . 2. S. LUTEA.
  Cal. 15-nerved; fl. white . . . 3. S. EUPHRASIOIDES.

1. **S. orobanchoides,** *Benth. in Hook. Comp. Bot. Mag.* i. 361 (1835).
Trim. in Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 299. Wight, Ic. t. 1414. Hook. Comp. Bot. Mag. i. t. 19.

A leafless root-parasite, stem 6–15 in., stout, cylindrical, branched, hairy-pubescent, arising from a large globose tuber (attached to the root of the host), scales small, crowded and

overlapping at base of stem, scattered or often somewhat whorled above, acute, passing into floral bracts, fl. numerous, sessile, erect, whorled, in erect tapering spikes, bracts ovate, rather shorter than cal., bractlets small, linear; cal. pubescent, segm. acuminate, very acute; cor.-lobes spreading, lowest narrower, 2-lobed; capsule ovoid-globose, tipped with long style.

Parasitic on the roots of *Euphorbia antiquorum* in the dry region; rare. Anuradhapura; Mihintale; several places near Hambantota. Fl. Aug.–December; dull pink or white.

Also in Arabia, Sind, Western India, Trop. and S. Africa.

The mode of parasitism is much that of the Broomrapes (*Orobanche*) of Europe, but with a larger more tuberous base of attachment to the roots of the host. The whole plant is either pale green when the fl. are white, or deep reddish-purple when they are dull pale purplish-pink. Dries black.

2. **S. lutea,** *Lour. Fl. Cochinch.* 22 (1790).

Buchnera asiatica, L. Sp. Pl. 630 (part). Moon Cat. 45. *S. hirsuta*, Benth., Thw. Enum. 220. C. P. 2028, 2886.

Fl. B. Ind. iv. 299 (not given for Ceylon).

Stem 3–9 in., erect, rigid, not branched (unless topped or injured), hispid, with prickly hair; l. small, under ½ in., sessile, opp. below, alt. above, linear, very hispid, with pustular prickles; fl. very shortly pedicellate, in long lax spikes, bracts shorter than cal., bractlets very short, linear; cal. hispid, with 10 ribs, segm. linear, acute, rigid; cor. 2-lipped, upper lip much shorter; capsule ovoid, blunt, shorter than cal.

Open grassy places up to 6000 ft.; common. Fl. June, Nov.; bright chrome-yellow.

Also in Peninsular India, Siam, Java, China, Arabia, Trop. and S. Africa, Madagascar.

Linnæus gives Ceylon for this, but does not quote any authority. Probably parasitic on the roots of grasses.

3. **S. euphrasioides,** *Benth. Comp. Bot. Mag.* i. 364 (1835).

Buchnera euphrasioides, Vahl, Moon Cat. 45. Thw. Enum. 220. C. P. 2287, 2079.

Fl. B. Ind. iv. 299. Wight, Ic. t. 855 (*Buchnera*).

Stems 6–18 in., erect, stiff, glabrous or slightly hispid, often much branched; l. ½–1 in., opp. below, alt. above, sessile, linear, entire, scabrous, with white pustular prickles; fl. rather large, very shortly pedicellate, forming long, lax, erect spikes; cal. campanulate, with 15 scabrous ribs, segm. linear-lanceolate, acuminate, very acute; cor.-tube much curved and exserted, pubescent outside, upper lip much shorter than lower; capsule ovoid, shorter than cal., valves strongly reflexed after dehiscence.

Grassy open places on damp sandy soil principally in the dry region; rather common. Fl. December–May; white.

Also in India and Java.

There is a specimen of this not named or numbered in Hermann's Herb., and it may probably be the Ceylon plant intended by Linnæus as *B. asiatica.*

Thwaites distinguishes two varieties here. His var. β (our common plant, C. P. 2029) has the calyx-segments shorter and broader, and much shorter bracts.

[*Buchnera hispida*, Ham., entered in Thw. Enum. 220 on the faith of specimens from Walker in Hb. Hook., appears to have been an error.]

14. **SOPUBIA,*** *Ham.*

Annuals, l. opp. or whorled, often cut into filiform segm., fl. rather large, solitary, axillary, with bractlets; cal. tubular-campanulate, segm. 5; cor. funnel-shaped or sub-rotate, lobes 5, nearly equal; stam. 4, didynamous, fil. short, curved, anth. connate in pairs, 2-celled, one cell opening by terminal pore, the other minute, stalked, empty; stigma flattened; capsule ovoid or oblong, rounded or notched at summit.—Sp. 8 or 9; 3 in *Fl. B. Ind.*

L. opp., fl. purple . . . . . 1. S. DELPHINIFOLIA.
L. in whorls of 3; fl. pale yellow . . 2. S. TRIFIDA.

1. **S. delphinifolia,** *G. Don, Gen. Hist.* iv. 560 (1838).
Gerardia delphinifolia, L., Moon Cat. 44. Thw. Enum. 220. C. P. 2022.
Fl. B. Ind. iv. 302. Roxb. Cor. Pl. t. 90 (not good).

Stem 1–3 ft., erect, with numerous long ascending branches, sub-quadrangular, glabrous; l. opp., 1½–2 in., pinnatisect, the divisions few, distant, filiform, spreading, flexuous, with in-curved edges, the uppermost ones (bracts) simple, long, filiform; fl. numerous, ped. about half as long as cal., bractlets long, filiform; cal. glabrous, segm. shorter than tube, linear, acuminate, very acute; cor.-tube campanulate-funnel-shaped, limb ½ in. diam., lobes broad, spreading; capsule longer than cal.-tube, rounded at top.

Open grassy places in both dry and moist regions, ascending to 4000 ft. in the latter; rather common. Fl. Feb., Aug.; rather dull pale purple.
Also in Peninsular India, chiefly in the south.

2. **S. trifida,** *Ham. in Don, Prodr. Fl. Nep.* 88 (1825).
Benth. in DC. Prod. x. 522. Thw. Enum. 220. C. P. 525.
Fl. B. Ind. iv. 302.

* From the native name in Nepal.

Stem 1–2 ft., erect, stiff, simple, slender, furrowed and angular, glabrous or minutely puberulous; l. sessile, in whorls of 3, about 1½ in., linear, filiform, very acute, the upper entire, the lower with 2 long linear-filiform spreading segm., glabrous above, minutely pubescent beneath, fl. 3 in a whorl, on slightly drooping slender ped. rather shorter than l., bractlets long, linear; cal. glabrous outside, woolly within, segm. ovate, acute, inflexed; cor. sub-rotate, tube very short, widened at mouth, limb 1¼ in. diam., lobes rotundate, spreading; stam. exserted and declinate, fil. short, curved; style longer than stam.; capsule enclosed in slightly enlarged cal., notched at the top, tipped with withered style.

On the patanas of upper montane zone; common. Fl. all the year; pale pinkish-yellow, with a purplish eye.

Also in the mountains of S. India and the Himalaya.

Every leaf has in its axil a very short leafy branch which remains undeveloped; hence the 'fascicled' leaves described in books.

15. CENTRANTHERA, *Br.*

Herbs, l. opp. or alt., sessile, hispid, fl. axillary, with bractlets; cal. split down one side, the segm. combined; cor.-tube widely tubular-funnel-shaped, lobes 5, subequal, spreading; stam. 4, didynamous, included, anth. not connate in pairs, cells spurred at base, one sometimes empty; stigma dilated, acute; capsule enclosed in cal., ovoid or subglobose, loculicidally 2-valved; seeds very numerous, conical, striate.—Sp. 5; all in *Fl. B. Ind.*

Leaves oblong.
  Cal. ½ in. long . . . . . . 1. C. PROCUMBENS.
  Cal. ¼ in. long . . . . . . 2. C. HISPIDA.
Leaves linear . . . . . . 3. C. HUMIFUSA.

1. **C. procumbens,** *Benth. in DC. Prod.* x. 525 (1846). **Dutu-satutu,** *S.* [PLATE LXVIII.]

Herm. Mus. 20. Fl. Zeyl. n. 238. *Rhinanthus indica*, L. Sp. Pl. 603. *C. Brunoniana*, Thw. Enum. 220 (non Benth.). C. P. 2026.

Fl. B. Ind. iv. 301.

Root thick, much branched, bright orange-red, stems numerous, spreading or erect, 3–18 in., obscurely quadrangular or compressed, hispid, with spreading white hair, often purple; l. ½–1 in., oblong, obtuse, rather thick and stiff, sparsely bristly-hairy and ciliate, with large sunk glands, veinless; fl. rather large, very shortly stalked, solitary, bractlets small, linear; cal. nearly ½ in., spathaceous and flattened, with 5 slightly winged angles, hispid-hairy, apex acute; cor. 1 in., lobes

rounded; capsule $\frac{3}{8}$ in., ovoid, valves often split into 2; seeds yellow.

Damp places in the low country of the moist region up to 3000 ft.; rather common; in the dry region very rare; Batticaloa (Gardner). Fl. all the year; white, usually with a large brownish-pink stain on upper side of throat.

Also in S. India.

Remarkable for the intensely bright orange-coloured roots. The plant is used as a medicine in fevers, and externally for sore eyes. Linnæus's description of Hermann's specimen is very good, but his name is in Fl. B. Ind. referred to the totally different *Geniosporum elongatum.*

2. **C. hispida,** *Br. Prodr.* 438 (1810).
Thw. Enum. 220. C. P. 2025.
Fl. B. Ind. iv. 301. Wall. Pl. As. Rar. t. 45.

Stem erect, 2–3 ft., stout, hispid-hairy, branched above; l. opp., $\frac{3}{4}$–$1\frac{1}{4}$ in., oblong, subacute, hispid on both sides; fl. rather large, sessile, in very lax erect spikes, bracts shorter than cal.; cal. $\frac{1}{4}$ in., acute, hairy; cor. $\frac{3}{4}$ in., lobes rounded; capsule ovoid, seeds spirally striate.

Wet places and paddy fields in the moist low country to 3000 ft.; rather rare. Kalutara; Hiniduma; Opatte; Hunasgiriya (Gardner). Fl. Dec.–March; pink, tube orange-yellow.

Also in India, Burma, Java, Philippine Is., China, Australia.

3. **C. humifusa,** *Wall. Cat.* n. 3883 (1828).
Thw. Enum. 221. C. P. 2888.
Fl. B. Ind. iv. 301.

Small, usually much branched from the base, branches slender, prostrate or spreading, hispid; l. $\frac{1}{2}$–$\frac{3}{4}$ in., opp. below, alt. above, linear, obtuse, pustular-hispid; fl. small, sessile; cal. $\frac{1}{8}$ in., apex obtuse; cor. $\frac{1}{4}$ in.; capsule globose, tipped with long style.

Wet places in the low country; rare. Galle; Colombo; Kurunegala. Fl. Aug.–Nov.

Also in India, Malaya, China.

16. PEDICULARIS, *L.*

Annual, l. alt., fl. in erect racemes, without bractlets; cal. tubular-campanulate, split down one side nearly to base, segm. obscure, leafy, crested; cor.-tube cylindrical, limb strongly 2-lipped, upper one erect, hooded, compressed, lower large, with 3 spreading lobes; stam. 4, didynamous, anth. meeting in pairs, cells equal, parallel, all perfect; stigma capitate; capsule compressed, falcate, loculicidally 2-valved. —Sp. 120; 37 in *Fl. B. Ind.* (all from Himalayas but the following and one other from Nilgiris).

1. **P. zeylanica,** *Benth. Scroph. Ind.* 54 (1835).
Benth. in DC. Prod. x. 580. Thw. Enum. 221. C. P. 229.
Fl. B. Ind. iv. 317. Wight, Ic. t. 1419.

Stem 6–18 in., erect, scarcely branched, slightly pubescent, cylindrical; l. alt., mostly crowded near base of stem, few and distant above, passing into bracts, 1–2 in., oblong, pinnately cut into numerous obtuse crenate lobes, glabrous above, more or less pubescent beneath, margin crenulate, reflexed, lower with short petioles, upper sessile; fl. rather large, on short ped., in lax erect racemes, bracts leafy; cal. thin, nearly glabrous; lower lip of cor. $\frac{2}{3}$ in. diam., lobes broad, subacute, upper lip rounded, not beaked; capsule $\frac{1}{2}$ in., twice as long as cal., upper part compressed, falcate, acute.

Wet places in the upper montane zone; common. Fl. Feb., Aug., Sept.; bright pink.

Also in the mountains of S. India.

A beautiful plant, and the only species of this fine alpine genus, so abundant in the Himalayas, occurring here. Dries nearly black.

XCIII.—OROBANCHACEÆ.

Perennial root-parasites without leaves or chlorophyll, fl. usually large, on short scapes from a fleshy rootstock, bisexual, rather irregular; cal. free, spathaceous or 2-lipped or with 5 segm.; cor.-tube funnel-shaped, lobes 5, nearly equal, imbricate with the 2 upper lobes outside; stam. 4, didynamous, anth. usually connate in pairs, 1-celled, opening by an apical pore, the other cell usually represented by a recurved spur; ov. superior, 1-celled, ovules very numerous on 2 large parietal placentas, stigma flat or clavate; fruit a 2-valved capsule; seeds minute, with fleshy endosperm.

Cal. split down one side, spathaceous . . 1. Æginetia.
Cal. with 5 segm. or 2-lipped.
  Anth. spurred; stigma dilated . . . 2. Christisonia.
  Anth. not spurred; stigma clavate . . 3. Campbellia.

These parasitic flowers—for they are little more—are found at the base of shrubs in shady forests; we have 8 species. *Æginetia* occurs in the low country, *Christisonia* and *Campbellia* in the mountain region; 3 species of *Christisonia* are endemic.

1. ÆGINETIA, *L.*

Rhizomatous leafless perennials, fl. few, large, on scapes; cal. large, spathaceous, split down the front to the base; cor.-tube broad, curved, lobes 5, nearly equal, obscurely 2-lipped; stam. 4, inserted near base of cor., fil. short, anth. connate in pairs, 1-celled, in the lower pair the absent cell represented by a recurved spur; ov. 1-celled, placentas 2, much branched or lobed, completely covered with very numerous ovules filling the cavity, stigma peltate; capsule partially 2-valved, seeds very small, reticulate.—Sp. 4 or 5; 2 in *Fl. B. Ind.*

Fl. uniformly purplish-red . . . 1. Æ. INDICA.
Fl. violet white and yellow . . . 2. Æ. PEDUNCULATA.

1. **Æ. indica,** *L. Sp. Pl.* 632 (1753). **Kolikara-mal,** *S.*
Moon Cat. 45. Thw. Enum. 221. C. P. 1778.
Fl. B. Ind. iv. 320. Wight, Ic. t. 895.

Rhizome rather small, tuberous, with numerous short branched coral-like roots; scapes 1 or several from rhizome, 6–12 in., erect, slender, rarely branched at the base, stout, glabrous, with or without 2 or 3 scales at base; fl. large, solitary, terminating scape, nodding; cal. 1–1½ in., completely closed in bud, pointed, glabrous, veined; cor. exserted, tube 1–1½ in., curved, inflated, limb ¾–1 in. diam., lobes small, equal, rounded; spurs of lower pair of anth. thick, blunt; capsule ¾ in., ovoid, beaked, enclosed in persistent cal. and cor.; seeds extremely numerous, deeply reticulate, pale yellow.

Low country up to 3000 ft., especially in the moist region; rather common, parasitic on various roots. Fl. all the year; dull red-purple.
Also in India, Burma, China, Philippine Is., Japan.
The whole plant is coppery-purple in colour, drying brown.

2. **Æ. pedunculata,** *Wall. Pl. Asiat. Rar.* iii. 13 (1832).
Æ. acaulis, var. *α*, Thw. Enum. 221 (?). C. P. 3635?
Fl. B. Ind. iv. 320 (not given for Ceylon). Wall. Pl. As. Rar. t. 219. Wight, Ic. t. 1421.

Rhizome small, short; scapes numerous, close, 3–4 in., stout, widened upwards, branched, glabrous; scales very few, short, fleshy; cal. about 1½ in., very thick, glabrous, pointed, pale ochre-yellow, longitudinally veined within; cor. slightly exserted, tube very wide, limb about 1 in. diam., somewhat 2-lipped, lobes rounded, minutely denticulate, 2 upper smaller; fil. slightly pubescent, spurs of lower anth. recurved, flattened (the upper anth. also very shortly appendiculate); style long,

stout, curved, stigma triangular-cordate with a transverse furrow, velvety; capsule not seen.

Dry region; very rare. Parasitic on Mana grass (*Andropogon*) near Nilgala, abundant (Mr. W. P. Campbell). Fl. Nov.; tube of cor. white, lemon-yellow within, limb bright purple-violet, with a yellow spot on the lower lip.

Also in Peninsular India, Singapore, Java, and Cochin-China.

I have seen no specimen of C. P. 3635 (which was collected 'below Haputale'), so am not sure that that plant was the same as the present one. The above description was made entirely from the Nilgala specimens. *Orobanche acaulis*, Roxb. Cor. Pl. t. 292, referred to this in Fl. B. Ind., seems to be different.

2. **CHRISTISONIA**,* *Gardn.*

Leafless perennials with a fleshy rootstock, fl. few, large, on short scapes with a few fleshy scales, ped. with or without a pair of bractlets; cal. tubular, 2-lipped or with 5 short segm.; cor.-tube funnel-shaped, wide at mouth, lobes 5, nearly equal or obscurely 2-lipped; stam. 4, usually included, anth. connate in pairs, 1-celled, opening by a large pore at apex, absent cell represented by a spur; ov. 1-celled, placentas 2, bifid or T-shaped (sometimes meeting but not uniting in centre), with very numerous ovules, stigma dilated, flattened, crescent or kidney-shaped or oval; capsule loculicidally 2-valved.—Sp. 10; 9 in *Fl. B. Ind.*

Cal. 2-lipped; ped. without bractlets.
  Cor. purple and white . . . . 1. C. SUBACAULIS.
  Cor. pale yellow . . . . . 2. C. THWAITESII.
Cal.-segm. 5.
  Ped. without bractlets . . . . 3. C. TRICOLOR.
  Ped. with a pair of bractlets.
    Cal. pubescent, red. . . . . 4. C. BICOLOR.
    Cal. glabrous, white . . . . 5. C. ALBIDA.

1. **C. subacaulis**, *Gardn. in Calc. Journ. Nat. Hist.* viii. 162 (1847).
Æginetia acaulis, var. β, Thw. Enum. 221. C. P. 2972.
Fl. B. Ind. iv. 321. Wight, Ic. t. 1423 (not good).

Rhizome short, thick, erect, scapes very short, scarcely 1 in., scales large, broad, truncate and erose, slightly fleshy, white; fl. crowded, erect, ped. without bractlets; cal. 1¼–1½ in., usually 2-lipped, but segm. often 3–5, short, acute, irregular and unequal, acute or erose, white; cor.-tube nearly 2 in., limb 1½–2 in. diam., lobes rounded, nearly equal; spurs of

---

* Dedicated to Dr. (afterwards Sir) Robert Christison, Professor of Materia Medica in the University of Edinburgh for 45 years. Died January, 1882.

anth. fleshy, decurved ; style long, subexserted, stigma large, circular ; fruit not seen.

Forests of montane zone, 3000–6000 ft.; rather rare. Parasitic on the roots of *Arundinaria* and other bamboos. Ramboda ; Naranhena ; Hewahette ; Madulkelle ; Nuwara Eliya ; Maskeliya (Farmer). Fl. Oct., Nov., and April ; tube and throat of cor. white, lobes deep purple, the lowest one with a yellow blotch.

Also in the Nilgiri Mountains.

The name *subacaulis* is not distinctive ; it was bestowed by Bentham, who referred the plant to *Phelipæa ;* Gardner simply transferred it to *Christisonia*, and had never seen a specimen. The species is, perhaps, equally well placed (as by Thwaites) in *Æginetia*, and is certainly allied to *Æ. pedunculata*, thus connecting the two genera. The description in Fl. B. Ind. is incorrect in several points.

2. **C. Thwaitesii,** *Trim. in Journ. Bot.* xxiii. 240 (1885). [PLATE LXIX.]

C. unicolor, Thw. Enum. 222 (non Gardn.). *C. neilgherrica*, Hk. f. in Fl. B. Ind. iv. 322, in part (non Gardn.). C. P. 2971.

Rhizome small, with coral-like roots, scape short, stout, erect, 2–3 in., scales oblong-oval, obtuse, glabrous, scattered ; fl. 3–8, racemose, not crowded, ped. ½–1 in., stout, glabrous, without bractlets ; cal. 1¼ in., quite closed in the bud (which is beaked), deeply 2-lipped, the lips irregularly or faintly 2- and 3-toothed, glabrous ; cor. 1½–2 in., glabrous outside, lobes short, rounded ; stam. half-exserted, fil. glabrous, spurs of lower pair of anth. longer than those of upper pair ; stigma reniform or crescent-shaped ; placentas large, fleshy, meeting in centre ; capsule over ½ in., beaked with persistent style.

Lower montane zone, 3000–4000 ft.; very rare. Palagala above Ramboda (Thwaites). Fl. October ; bright pale yellow.

Endemic.

Whole plant coloured like *Campbellia*, but brighter, the flowers paler yellow, but all drying black. I have not met with it living. The Fl. B. Ind. places this under *C. neilgherrica* (*i.e.*, *Campbellia*), from which it is quite distinct. Its characters bring it under Wight's genus, *Oligopholis.*

3. **C. tricolor,** *Gardn. in Calc. Journ. Nat. Hist.* viii. 156 (1847). Thw. Enum. 222. C. P. 2889.
Fl. B. Ind. iv. 323.

Rhizome small, with coral-like roots, scapes numerous, 3–4 in., scales oblong, obtuse, glabrous, brown ; fl. large, ped. about 1 in., without bractlets ; cal. 1 in., glabrous, bluntly 5-angled, segm. 5, lanceolate, very acute, cor.-tube 2½ in., glabrous outside, limb about 1 in. diam., lobes rather small, the 2 upper connate, margins denticulate ; fil. equal, glabrous, anth.-spurs long, blunt ; placentas covered on all sides with

ovules, style much longer than stam., stigma transversely oval; capsule ovoid-globose, pointed, slightly bi-lobed.

Var. β, **grandiflora,** *Hk.f.* *C. grandiflora*, Gardn. l. c. 155. Thw. Enum. 221. C. P. 3805.

Limb of cor. about 2 in. diam., lobes much larger, especially the upper ones, much crisped on margin.

Forests in lower montane zone, 3000–5000 ft.; common, parasitic on roots of *Acanthaceæ.* Var. β, Adam's Peak (Gardner); Knuckles. Fl. July–October and March; upper lobes of cor. deep red-purple, lower lobes pale rosy-purple, throat and tube bright yellow within, cal. purplish-red. Var. β, all lobes rosy-purple.

Endemic.

This is our most beautiful and common species of these handsome parasitic flowers. The three upper cal.-segm. are not unfrequently combined to form an upper calycine lip.

4. **C. bicolor,** *Gardn. in Calc. Journ. Nat. Hist.* viii. 160 (1847). Thw. Enum. 222. C. P. 3108.

Fl. B. Ind. iv. 322. Wight, Ic. t. 1486 (?) (*C. aurantiaca*).

Rhizome slender, ascending, not branched, with numerous short fleshy horizontal roots, scales numerous, often overlapping, oblong, obtuse, pubescent; fl. 1–5, on stout ped. or nearly sessile, in axils of upper scales, bractlets large, near base of ped., cal. about $\frac{3}{4}$ in., tubular, scabrous-pubescent, quite cylindrical, segm. 5, very short, triangular, acute; cor.-tube more than twice as long as cal., with long soft white hair outside, funnel-shaped, limb rather over 1 in. diam., 2 upper lobes rather smaller; fil. didynamous, pubescent, spurs of anth. very sharp; ov. with placentas meeting in centre so as to appear 2-celled, style longer than stam., curved at top, stigma semi-lunate or reniform.

Var. β, **pallidiflora,** *Thw. l. c.* *C. pallida*, Gardn. l. c. 159. C. P. 1781.

Larger; limb of cor. $1\frac{1}{2}$ in. diam., white, often tinged with pink.

Var. γ, **spectabilis,** *Trim. in Journ. Bot.* xxiii. 241. C. P. 3983.

Still larger, rhizome long, stout; cor.-tube over 2 in., yellow, limb 2 in. diam., pure white.

Forests of lower montane zone, 3000–5000 ft.; rather common. Var. β also in the low country at Hiniduma. Var. γ on the Knuckles Mountains. Fl. July–October, and Feb., March; cor. uniform deep golden yellow, limb white in β and γ, cal. orange-scarlet.

Also in the Nilgiri Mountains.

The type is a frequent ornament of our submontane forests, and the brilliant flowers are very conspicuous amid the dead leaves. It is parasitic on *Acanthaceæ* and other plants. *C. pallida*, Gardn., was founded wholly

on a drawing of a specimen collected by Lear on Hunasgiriya. The varieties are connected with the type by intermediates. Dries black. *C. unicolor*, Thw. (non Gardn.), seems to be this (C. P. 1780).

5. **C. albida,** *Thw. in Benth. & Hk. f. Gen. Pl.* ii. 967 (1876). C. P. 3929.
Fl. B. Ind. iv. 323.

Scape short, scales ovate, glabrous; fl. large, crowded, ped. ½ in., with 2 bractlets some distance below fl.; cal. ¾ in., glabrous, segm. 5, very small, linear; cor.-tube 1½ in. or more, pubescent outside, limb 1½ in. diam., lobes broad, truncate.

Upper montane zone; very rare. Hakgala, 1866 (Thwaites). Fl. Oct.; white.
Endemic.
The whole plant is white according to Thwaites's notes. I have not met with it, and have only the C. P. specimens. Bentham referred it to *Campbellia* in Gen. Pl. (l. c.). The ov. is said in Fl. B. Ind. to be completely 2-celled.

3. CAMPBELLIA,* *Wight.*

Leafless perennial, with short scaly rootstock, fl. small, crowded on short scape, ped. with bractlets; cal. tubular-campanulate, segm. 5, equal; cor. funnel-shaped, lobes 5, nearly equal; stam. 4, exserted, anth. distinct, 1-celled, opening by a tubular pore at apex, without a spur or other appendage; ov. 1-celled, placentas 2, T-shaped, meeting in centre, style long, crooked at summit, stigma ovoid or clavate. —Sp. 3 (?). The genus is not maintained in the *Fl. B. Ind.*

C. cytinoides, *Wight, Ic.* iv. pt. 3, 6 (1850).
Christisonia unicolor, Gardn. in Calc. Journ. Nat. Hist. viii. 161. Thw. Enum. 427. Trim. in Journ. Bot. xxiii. 241. C. P. 3770.
Fl. B. Ind. iv. 322 (*Christisonia neilgherrica*, in part). Wight, Ic. t. 1425.

Scape very stout, short, thickened upwards, covered with numerous thin imbricated obtuse scales; fl. rather numerous, densely crowded, on very short ped. with 2 broad bractlets immediately beneath the cal.; cal. ¾ in., glabrous or puberulous, segm. triangular, subacute, sometimes lacerate; cor. pubescent outside, lobes broad, rounded; anth. small, ovoid, apical pore turned downwards; placentas without ovules on their opposed surfaces.

---

* In honour of Dr. W. H. Campbell, first Secretary of the Edinburgh Botanical Society, and his brother, Capt. J. Campbell, of the Madras Establishment.

Forests in the upper montane zone, parasitic on the roots of *Strobilanthes;* rather rare. Near the foot of Pedurutalagala; near the summit of Hakgala. Fl. August; bright yellow.

Also in the Nilgiri Mountains.

The whole plant is a uniform pale lemon-yellow colour, but it dries quite black.

Sir J. Hooker in Fl. B. Ind. discards the genus *Campbellia*, and refers this plant back to *Christisonia*, where Gardner had first placed it.

Christisonia unicolor, Gardn., was described entirely from a poor drawing in the Peradeniya Herbarium, the original specimen being stated to have been collected by Mr. Lear on Hunasgiriya in 1839. This specimen does not exist, but the drawing represents a plant wholly bright yellow with white exserted stamens, and is almost certainly meant to represent *Campbellia*. C. P. 1780, quoted doubtfully for this by Thwaites, consists of a single flower collected by Gardner on Hantane, and is apparently *C. bicolor.*

XCIV.—LENTIBULARIACEÆ.

ANNUAL herbs, aquatic or terrestrial, l. whorled and persistent or alt. and disappearing before the flowering period, usually bearing minute bladders at their bases; flowering stem (in the terrestrial forms) erect, with a few root-fibres at the base and 2 or 3 small scales; fl. bisexual, irregular, few, in lax racemes, bracts small, cal. free, divided into 2 almost distinct sep., often enlarged in fruit; cor. 2-lipped, spurred at base, upper lip entire or slightly bilobed, lower lip large, often 3–5-lobed; stam. 2, inserted at base of cor., fil. broad, anth.-cells confluent; ov. superior, 1-celled, with numerous ovules on a free basal placenta, style very short, broad, stigma dilated, bilobed; fruit a 2- or 4-valved capsule; seeds ovoid, rarely flattened, without endosperm.

Our 8 species are well distributed throughout the island; one—*U. stellaris*—is confined to the dry region; two—*U. exoleta* and *U. reticulata*—to the moist low country; and two—*U. affinis* and *U. orbiculata*—to the montane zone. There is no endemic species.

UTRICULARIA, *L.*

For characters, see *Order.*—Sp. 150; 22 in *Fl. B. Ind.*

Aquatic; stems submerged, l. whorled, with capillary segm., persistent.
 Fl. on short ped.; infl. with a whorl of spongy floats at base . . . . 1. U. STELLARIS.

Fl. on long ped.; infl. without floats.
Large; seeds not winged . . . . . . 2. U. FLEXUOSA.
Very small; seeds broadly winged . . . 3. U. EXOLETA.
Terrestrial; stems creeping, filiform, and with the alt. l. usually evanescent (except in 10).
L. more or less linear; cal.-segm. nearly equal; seeds reticulate.
Scales and bracts not spurred at base.
Fl. purplish-blue.
Sep. oval or ovate, acute.
Spur of cor. slightly curved . . . 4. U. CÆRULEA.
Spur straight.
Flowering-stem short, not twining . 5. U. AFFINIS.
Flowering-stem long, usually twining . 6. U. RETICULATA.
Sep. rotundate, very obtuse . . . 7. U. CAPILLACEA.
Fl. yellow . . . . 8. U. BIFIDA.
Scales and bracts spurred at base; fl. white or purplish . . . . 9. U. NIVEA.
L. orbicular; cal.-segm. very unequal; seeds glochidiate . . . . 10. U. ORBICULATA.

The delicate stems and leaves, with the small bladders (adapted for the capture of minute animals), from which the genus takes its name, are commonly overlooked in the land forms in consequence of their fugacious character. They are described and figured in all our species (except *U. capillacea*) in Goebel's memoir in 'Ann. Jard. Buitenzorg,' ix. (1891), which was worked out partly from Ceylon material.

1. **U. stellaris,** *L. f. Suppl. Pl.* 86 (1781).
Moon Cat. 4. C. P. 3960.
Fl. B. Ind. iv. 328. Hook. Bot. Misc. iii. t. Supp. 27; rep. in Wight, Ic. t. 1567.

Stems submerged, often very long, slender, slightly branched; l. all submerged, very numerous, closely placed, apparently in whorls of 4, 1½–2½ in., pinnately cut into numerous filiform very slender pectinate segm. each provided near the base with a small globular-ovoid bladder; fl. few, on short ped., in erect axillary racemes, peduncle long, provided below the infl. with a whorl of 4–8 sessile, large, oblong-ovoid, acute, spongy floats which support the fl. above the water; bracts short, no bractlets; sep. ovate, obtuse, veined; cor. ¼ in. diam., spur a little shorter than lower lip, blunt, curved, fruit not seen.

In rather deep water, tanks, &c. in the dry district; common. Moon's locality is Jaffna. Fl. throughout the year; yellow.

Throughout the Tropics of the Old World.

The plant is omitted in Thw. Enum. The floats are, doubtless, modified leaves or bracts.

2. **U. flexuosa,** *Vahl, Enum.* i. 198 (1805). **Diya-pasi,** *S.*
Herm. Mus. 9. Burm. Thes. 140. Fl. Zeyl. n. 22. *U. vulgaris*, L. Sp. Pl. 18 (in part). Moon Cat. 4. Thw. Enum. 171. C. P. 2089.
Fl. B. Ind. iv. 329. Wight, Ic. t. 1568.

Stems floating in large masses a little beneath the surface, often very long, rather stout, much branched ; l. in whorls of 4, $1\frac{1}{2}$–3 in., pinnately filiform-pectinate, each pinna with a nearly globose bladder near the base ; fl. few, on long ped., at first erect, afterwards deflexed and thickened, in an erect raceme, bracts small, ovate, membranous, peduncle long, the whorl of l. at its base often with the rachis much inflated (acting as a float) and the segm. very short ; sep. ovate, obtuse, enlarged in fruit ; cor. $\frac{1}{2}$ in. diam., spur rather shorter than lower lip ; capsule globose, beaked with thick persistent style; seeds discoid, not winged.

In the water of tanks and deep ditches in the low country, especially in the dry region ; common. Fl. Aug.–December ; yellow.

Throughout Tropical Asia and Australia.

The common floating species here, and very like *U. minor*, L., of Europe. Linnæus referred it to *U. vulgaris*, remarking that it is almost the only Ceylon plant collected by Hermann which is also European.

3. **U. exoleta,** *Br. Prodr.* 430 (1810).
U. diantha, R. & S., Thw. Enum. 171. C. P. 2828.
Fl. B. Ind. iv. 329. Wight, Ic. t. 1569.

Very small, stems filiform ; l. with few extremely slender segm. and minute vesicles ; fl. very small, on rather long slender ped., solitary or 2 on long slender erect peduncle without floats at base ; sep. broad, truncate ; cor. $\frac{1}{4}$ in., spur rather longer than lower lip ; capsule globose, exceeding cal. ; seeds flattened, circular, with a broad wing.

In the water of paddy fields, moist low country ; rather rare. Colombo ; Peradeniya. Fl. Feb. and September ; yellow.

A very small plant, with the floating submerged leaves often but slightly developed.

4. **U. cærulea,** *L. Sp. Pl.* 18 (1753). **Nil-monaressa,** *S.*
Herm. Mus. 18. Fl. Zeyl. n. 23. Moon Cat. 4. Thw. Enum. 171. C. P. 278 (2086).
Fl. B. Ind. iv. 331. Wight, Ic. t. 1573 (*U. uliginoides*) ; t. 1575 (*U. conferta*) ; t. 1578 (*U. pedicellata*).

Stems creeping, filiform, branched, l. numerous, often 1 in. or more long, linear-spathulate, obtuse, very thin, giving off from their surface flat offshoots, on which usually the bladders are situate ; flowering stem 2–12 in., erect, unbranched, with one or two distant scaly bracts ; fl. on rather long spreading ped., secund, 2–10, distant in a long raceme ; sep. triangular-ovate, very acute ; lower lip of cor. $\frac{1}{3}$ in. diam., broadly oval, spur slightly curved, projecting downwards nearly at right angles with fl., sharply pointed ; capsule very small ; seeds oblong-ovoid, reticulate.

Wet places from 2000–6000 ft.; common. Fl. Jan.–March and August; pale purplish-blue, spur violet.

Also in the hills of S. India.

The matted stems and numerous erect leaves form dense masses, and sometimes persist to the flowering period, but usually die away before.

5. **U. affinis,** *Wight, Ic.* iv. pt. 4, 11 (1850).
U. cærulea, var. β, Thw. Enum. 171. C. P. 3308.
Fl. B. Ind. iv. 330 (not given for Ceylon). Wight, Ic. t. 1580, f. 1, and 1578, f. 1 (*U. brachypoda*).

Stems and l. very evanescent, l. oblong-linear, obtuse, bearing bladders; flowering stem 2–5 in., simple, very slender, with 2 or 3 minute distant bracts; fl. on rather short ped., at first erect, afterwards nodding, distant, 2–4 in a very lax raceme; sep. ovate, acute, enlarged in fruit; lower lip of cor. $\frac{1}{4}$ in. diam., spur slender, straight, pointed, at right angles with fl.; capsule ovoid, enclosed in enlarged sep.; seeds subglobose, reticulate.

Wet places in upper montane zone; rare. Horton Plains. Fl. Feb.; purplish-blue.

Also in S. India.

Thwaites considered this merely as a variety of *U. cærulea.*

6. **U. reticulata,** *Smith, Exot. Bot.* t. 119 (1805). **Nil-monaressa,** *S.*
Thw. Enum. 171. C. P. 2090 (2091).
Fl. B. Ind. iv. 331. Wight, Ill. t. 143, and Ic. t. 1574, right-hand fig. (*U. uliginosa*).

Stems filiform, l. numerous, $\frac{1}{2}$–$\frac{3}{4}$ in., erect, linear, with numerous bladders, disappearing before flowering; flowering stem tall, 9–18 in., slender, weak, flexuose and twining, with 2 or 3 distant bracts; fl. large, on erect ped., distant, 4–6 in raceme; sep. oval, acute, tapering at base and decurrent on ped., much enlarged in fruit; lower lip of cor. about $\frac{1}{2}$ in. diam., orbicular, entire, bullate with conspicuous reticulate venation in centre, spur nearly straight, sharp, shorter than lower lip; capsule flask-shaped; seeds reticulate.

Var. **stricticaulis,** *Kœnig ex Oliver in Journ, Linn. Soc.* iii. 180. C. P. 2088. Wight, Ic. t. 1574, left-hand figs. (*U. uliginosa*).

Flowering stem shorter, 3–6 in., stouter; fl. on shorter ped., more numerous and more closely placed.

Wet places in the moist low country below 1000 ft.; rather common. Galle; Colombo; Ratnapura; Pasdun Korale. Var. β in the dry districts —Jaffna; Batticaloa; Haragama. Fl. Dec.–April, and July; purple-blue, the lip white, reticulated with darker veins.

This is the most beautiful of our species; the flowers are large and of various shades. The slender stems in the type twine round one another and neighbouring vegetation for a foot or two in height, and thus show their flowers well.

7. **U. capillacea,** *Wall. Cat.* n. 6399 (1828) (? Willd.).
Thw. Enum. 171. C. P. 3307.
Fl. B. Ind. iv. 332 (*U. scandens*, var.) (not given for Ceylon).

A minute plant; l. not seen; flowering stem 1–2 in., erect, filiform; fl. 2–4, nearly sessile or on very short ped., very small, distant; sep. rotundate, very obtuse, concave; spur of cor. very short, pointed; capsule ovoid, seeds not flattened.

Low country; very rare. Near Colombo (Ferguson); Negombo (Thwaites). The C. P. specimens are labelled Katukande, 1854. Fl. July; purple (Thwaites).

Also in S. India.

Our plant is quite unlike *U. Wallichiana*, Wight, to which it is referred in Fl. B. Ind. through some mistake. I have not seen fresh specimens.

8. **U. bifida,** *L. Sp. Pl.* 18 (1753).
Vahl, Syn. Pl. i. 202. Moon Cat. 4. Thw. Enum. 171. C. P. 2087.
Fl. B. Ind. iv. 332. Wight, Ic. t. 1572, f. 2 (*U. humilis*).

Stems filiform, creeping, much branched; l. 1–2 in., linear, bearing sessile bladders at the base, usually withered before flowering; flowering stems 3–10 in., erect, slender, with 2 or 3 distant lanceolate acute scales, fl. 2–10, on short recurved ped., distant; sep. ovate, obtuse, greatly enlarged in fruit; cor. rather small, lower lip $\frac{1}{4}$ in. diam., spur rather over $\frac{1}{4}$ in., slightly curved, pointed; capsule much shorter than enlarged membranous sep.; seeds not compressed, reticulate.

Wet sandy places in the low country; common. Fl. Feb., March; yellow.

Tropical Asia generally.

The leaves often form dense mats over the surface of the soil.

9. **U. nivea,** *Vahl, Enum. Pl.* i. 203 (1805).
Moon Cat. 4. *U. racemosa*, Wall., Thw. Enum. 172. C. P. 2085.
Fl. B. Ind. iv. 333 (*U. racemosa*, var.). Wight, Ic. t. 1582 and 1583 (*U. cærulea*).

Stem and l. fugacious, not seen; flowering stems 4–12 in., erect, occasionally branched, with 2 or 3 distant scales which are acuminate at both ends or spurred at the base (looking as if attached by the middle), fl. often as many as 15, rather closely placed, forming a short raceme at top of stem, ped. very short, slender, recurved, bracts spurred like the stem-scales; sep. broadly ovate, obtuse, puberulous; spur of cor. longer than lower lip, large, pointed; capsule globose; seeds not compressed.

Var. β, **rosea,** *Thw. Enum.* 172. *U. rosea*, Oliv. in Journ. Linn. Soc. iii. 185 (? Edgw.). C. P. 277.

More robust, flowering stem stouter, fl. larger; spur of cor. shorter than lower lip.

Moist low country; rather common. Kalutara (Moon); Colombo; Ratnapura; Pasdun Korale; Badamua, S. Prov. Var. β in montane zone also, up to 6000 ft.; first collected by Gardner. Fl. Dec.-March; fl. white, or very pale blue or reddish-purple. Var. β, darker purple.

Also in India, Burma, China.

Var. β, endemic (?).

Dries black. Var. β is kept up as a species in Fl. B. Ind., being based on Gardner's n. 507, which is C. P. 277.

10. **U. orbiculata,** *Wall. Cat.* 1500 (1828).

U. glochidiata, Wight, Ic. iv. pt. 4, 11. Thw. Enum. 172. C. P. 2084, 3350.

Fl. B. Ind. iv. 334. Wight, Ic. t. 1581.

Stems numerous, creeping, filiform, very delicate, much branched; l. not fugacious but persistent during flowering period, very small, $\frac{1}{12}$–^{1} in., orbicular, tapering at base into rather long petiole, veined from the base, bladders on the stems, shortly stalked; flowering stem 2–4 in., very erect, filiform; fl. rather large (for the plants) 3–8, on long delicate very spreading ped., distant; sep. very unequal, broadly oval, very obtuse, enlarged in fruit; lower lip of cor. $\frac{3}{8}$ in. wide, 5-toothed or lobed, spur $\frac{1}{4}$ in. or more, very narrow, straight, pointed; capsule globose; seeds minute, oblong-oval, covered with glochidiate spines.

On wet rocks and tree-trunks in montane zone 3000–6000 ft.; common. Fl. Sept.-Dec.; pale violet, base of lip yellowish.

In the mountains of India, Malaya, and S. China.

An exquisite little plant, very common in the planting districts, growing with moss.

XCV.—GESNERACEÆ (*Cyrtandreæ*).

HERBS, rarely shrubby, l. alt., opp. or whorled, no stip.; fl. bisexual, large or small, usually irregular; cal. free, segm. or distinct sep. 5, valvate; cor. often 2-lipped, tube either long and tubular or campanulate or very short, lobes 5 (rarely 4), imbricate; perfect stam. 4 (didynamous or not) or 2, anth. often connate, 2-celled but with the cells confluent; ov. superior, 1-celled, with 2 parietal placentas, ovules numerous, stigma capitate, dilated or small; fruit a capsule, 2- or 4-valved, rarely circumscissile or indehiscent; seeds very numerous, reticulate, without endosperm.

Perfect stam. 4.
  Stam. didynamous; epiphytic shrub . . . 1. ÆSCHYNANTHUS.
  Stam. not didynamous; herbs.
    Cor. very unequally 2-lipped; anth. connate . 5. KLUGIA.
    Cor. rotate, lobes equal; anth. not connate .
      Cor. 4-lobed; l. opp. . . . . . . 4. CHAMPIONIA.
      Cor. 5-lobed; l. alt. . . . . . . 7. ISANTHERA.
Perfect stam. 2, anth. connate.
  Capsule linear, 2-valved.
    Sep. distinct; l. radical or alt. . . . 2. DIDYMOCARPUS.
    Sep. connate into cal.; l. opp. or whorled . 3. CHIRITA.
  Capsule globose, circumscissile . . . . 6. EPITHEMA.

With the exception of *Didymocarpus Humboldtianus*, no species is found in the dry region, but all in the moist, and the majority both in the hills and the low country. All the species of *Didymocarpus* and *Chirita* and *Klugia zeylanica* are endemic, as also is the monotypic genus *Championia*—in all, 8 out of our 12 species.

1. ÆSCHYNANTHUS, *Jack.*

An epiphytic shrub, l. opp. fl. solitary, axillary (apparently terminal); sep. 5, very narrow; cor. funnel-shaped-tubular, curved, 2-lipped, upper lip of 2 smaller lower lip of 3 larger lobes; stam. 4, didynamous, anth. connate in pairs, cells confluent; ov. 1-celled, placentas 2, recurved; capsule linear, 2- or sub-4-valved, seeds very numerous, oblong, with a very long hair-like process at each end.—Sp. 52; 23 in *Fl. B. Ind.*

Æ. zeylanica, *Gardn. in Calc. Journ. Nat. Hist.* vi. 474 (1845).
Thw. Enum. 206. Clarke, Mon. Cyrt. 26. C. P. 1782.
Fl. B. Ind. iv. 340.

Stems climbing, long, rooting at the thickened nodes, slender, cylindrical or slightly quadrangular, much branched, bark loose, smooth and shining, yellowish; l. 2½–4 in., linear-lanceolate, very much tapering into short thick petiole, acuminate, subacute, entire, glabrous, very fleshy, pale green; fl. few, solitary in axils of terminal pair of l., ped. under ½ in., slender, glabrous, deflexed; sep. linear, subacute, glabrous; cor. about about 1 in., finely pubescent outside; stam. exserted; style exserted, rather shorter than stam.; capsule about 6 in., linear, curved, valves thin and papery.

Var. β, **pinguis,** *Clarke, Mon. Cyrt.** 26.

L. smaller and thicker; cor. glabrous outside; capsule shorter.

---

* Mr. Clarke's monograph of the *Cyrtandreæ* is dated Sept., 1883, and therefore takes precedence of the part of the Fl. B. Ind. containing his

Climbing and rooting on the branches of trees and over rocks in the damp forests of the montane zone, 4000–7000 ft.; common. I have not seen var. β in Ceylon. Fl. Sept., Oct.; pinkish-red, lobes greenish-yellow within.

Also in the Nilgiri Mountains (var. β).

A pretty plant, but not to be compared with many of the fine Malayan species.

2. DIDYMOCARPUS, *Wall.* (*Rottlera*, Vahl).

Perennial herbs, l. alt., radical, fl. rather large, in branched cymes on naked scapes; sep. 5; cor. campanulate, tube wide, curved, more or less gibbous, oblique at mouth, lobes 5, nearly equal, rounded; stam. 2, inserted at base of cor.-tube, fil. short, anth. connate, cells confluent; staminodes 2 (rarely 3) small, club-shaped; ov. 1-celled (often apparently 2-celled), with 2 parietal placentas, stigma small, not dilated; capsule linear, loculicidally dehiscent with 2 straight valves; seeds very minute, ovoid, reticulate.—Sp. 70; 40 in *Fl. B. Ind.*

Rhizome erect, short; capsule pubescent.
  Scape hairy; cor. pubescent outside . . 1. D. HUMBOLDTIANUS.
  Scape floccose; cor. glabrous . . . 2. D. FLOCCOSUS.
Rhizome creeping; capsule glabrous . . 3. D. ZEYLANICUS.

1. **D. Humboldtianus,** *Gardn. in Calc. Journ. Nat. Hist.* vi. 477 (1845).
Thw. Enum. 207. Clarke, l. c. 102. C. P. 1784.
Fl. B. Ind. iv. 353. Bot. Mag. t. 4757.

Rootstock erect, short, stout; l. numerous, 2–4 in., oval, rounded but abruptly tapering and decurrent on petiole at base, rounded at apex, coarsely dentate-crenate, more or less silky-hairy on both sides, usually much bullate, venation conspicuous; scapes 3–12 in., erect, slender, hairy, fl. numerous, on slender glandular-pubescent ped., cymes lax, irregularly paniculate, bracts linear, hairy; sep. linear, obtuse, glandular-hairy; cor. about ½ in. diam., puberulous outside, tube gibbous beneath, lobes short, the lowest largest, capsule under 1 in., tapering to sharp point, glandular-pubescent.

Var. β, **primulæfolia.** *D. primulæfolia*, Gardn. l. c. 478. C. P. 1785.

Smaller; l. pubescent, not bullate.

Var. γ, **recedens,** *Clarke, l. c.* 103.

L. much larger; fl. more numerous.

On rocks, principally in the moist region extending up to 5000 ft.;

---

account of the same Order, which appeared in Jan. 1884. But, though published later, internal evidence shows the latter to have been written before the monograph.

common. Also in the dry region; rare, *e.g.*, Sigiri; Uma-oya; Ritigala. Fl. all the year, especially Sept.–Jan.; pale bright violet or nearly white, tube pale yellow.

Endemic.

The varieties are scarcely distinct enough for notice, passing insensibly into the type. Bot. Mag. t. 5161 (*D. primulæfolia*) is not that species, but *D. floccosus.*

2. **D. floccosus,** *Thw. Enum.* 207 (1860).
Clarke, l. c. 103. C. P. 3368.
Fl. B. Ind. iv. 354. Bot. Mag. t. 5161 (*D. primulæfolia*).

Rootstock large, erect; l. (including winged petiole) 6–9 in., rhomboid-oval, gradually tapering at base and decurrent along whole petiole, subacute or obtuse, shallowly serrate-crenate, densely silky above, softly silky-woolly beneath (floccose when young), bullate; scapes 6–8 in., floccose; fl. few, on floccose ped., cymes irregularly umbellate; sep. linear-oblong, obtuse; cor. $\frac{5}{8}$ in. diam., glabrous outside, tube very gibbous below; capsule $\frac{1}{2}$ in. or rather more, pubescent.

Low moist country; very rare. I have only seen the C. P. specimens collected at Raxawa, Dolosbagie, at about 2000 ft. Fl. Sept.–Jan.; pale violet.

Endemic.

3. **D. zeylanicus,** *Br. in Br. & Benn. Pl. Jav. Rar.* 119 (1838).
D. longipetiolata, Gardn. l. c. 475. Thw. Enum. 207. Clarke, l. c. 104. C. P. 352 (395, 1783).
Fl. B. Ind. iv. 354.

Rhizome slender, creeping; l. few, 2–3 in., broadly ovate or nearly orbicular, cordate at base, obtuse or subacute at apex, coarsely and irregularly crenate-serrate, finely silky with adpressed hair on both sides, petiole very long, 3–8 in., pubescent; scapes 6–7 in., slightly hairy; fl. few on slightly hairy ped., cymes umbellate-racemose; sep. linear, bristly-hairy, spreading; cor. over $\frac{3}{4}$ in. diam., glabrous, tube rather long, slightly gibbous; capsule $1\frac{1}{4}$–$1\frac{1}{2}$ in., glabrous.

Montane zone; very rare. Near Adam's Peak in Maskeliya between 5000 and 6000 ft. Fl. Dec.–March; white, tube purple within.

Endemic.

A beautiful little plant, well worth cultivation.

3. CHIRITA, *Ham.*

Perennial herbs often semi-shrubby at base, l. opp. or whorled, fl. large, solitary or in cymes, axillary; cal. deeply cut into 5 segm. (in *C. Moonii* to base); cor.-tube funnel-shaped-tubular, somewhat inflated but not gibbous beneath,

slightly oblique at mouth, lobes 5, subequal, rounded, the 2 upper slightly connate to form an upper lip; stam. 2, inserted near base of cor., fil. short, anth. connate with a tuft of hair on back, cells confluent, staminodes 2 (or 3) small, club-shaped, hairy at top; disk annular or lobed; ov. 1-celled with 2 reflexed placentas; stigma much dilated, peltate or with 2 unequal lobes; capsule linear, loculicidally 2-valved; seeds very numerous, reticulate.—Sp. 25; 18 in *Fl. B. Ind.*

Fl. solitary or in threes.
  Cal. cut to base; cor. $2\frac{1}{2}$ in. . . . . 1. C. Moonii.
  Cal. cut half way down; cor. under 2 in. . 2. C. Walkeri.
Fl. in paniculate cymes; cor. about $1\frac{1}{2}$ in. . 3. C. zeylanica.

1. **C. Moonii,** *Gardn. in. Calc. Journ. Nat. Hist.* vi. 479 (1845).
Martynia lanceolata, Moon Cat. 45. Thw. Enum. 207. Clarke, l. c. 111. C. P. 1789.
Fl. B. Ind. iv. 356. Bot. Mag. t. 4405.

A large perennial, stems 2–3 ft. or more, branched, stout, rather succulent, slightly thickened at nodes and marked with scars of l., densely tomentose-hairy when young; l. numerous, drooping, opp. or rarely 3 or 4 in a whorl, 3–6 in., narrowly lanceolate, tapering to both ends, acute, entire, densely covered with long silky yellowish hair on both sides, bright light green, lat. veins numerous, parallel, very oblique, conspicuous, petiole short, silky-hairy, dilated at base; fl. very large, numerous, solitary, ped. $1\frac{1}{2}$–2 in., hairy, with 2 small linear bracts above the middle; cal. cut to base into 5 nearly distinct sep., 1 in., oblong-lanceolate, acuminate, very acute, keeled, silky; cor. $2\frac{1}{2}$ in., limb nearly 3 in. diam., mouth oblique, lobes of upper lip broader than long; disk 5-lobed; ov. glabrous; capsule 4–5 in., glabrous.

Moist region to 4000 ft.; rare. Four Korales Dist. (Moon); Hantane; Kaduganawa; Ambagamuwa. Fl. June–October; clear mauve-violet, tube white, with a broad yellow line down lower side.

Endemic.

Perhaps the most beautiful of our flowering plants, and well known in stoves at home. It grows to a large size in cultivation.

2. **C. Walkeri,** *Gardn. in Calc. Journ. Nat. Hist.* vi. 480 (1845).
Thw. Enum. 207. Clarke, l. c. 112. C. P. 2843.
Fl. B. Ind. iv. 356. Bot. Mag. t. 4327 (*C. Walkeriæ*).

Stem and l. as in *C. Moonii* but the latter rather smaller and distantly denticulate, often 3 in a whorl; fl. smaller, on slender hairy ped., usually in threes, peduncles very slender, about 2 in., hairy; cal. over $\frac{3}{4}$ in. cut half way down, segm. linear, acuminate, hairy; cor. under 2 in., limb about 1 in.

diam., very slightly pilose outside; disk annular; capsule about 4 in.

Var. β, **parviflora,** *Clarke, l. c.* 112. C. P. 542.

L. with shorter pubescence; fl. often in fives; cor. under $1\frac{1}{2}$ in.

Moist region up to 7000 ft.; rare. Dolosbagie Dist.; Pedurutalagala. Var. β below 1000 ft. only. Pasdun Korale; Reigam Korale. Fl. throughout the year; violet, tube white, with a yellow line on lower side.
Endemic.
This is probably *Martynia nervosa* of Moon Cat. 45, from Uva. Also a lovely plant, but with smaller and darker flowers than *C. Moonii.*

3. **C. zeylanica,** *Hook. Bot. Mag.* t. 4182 (1845).
C. communis, Gardn. in Calc. Journ. Nat. Hist. vi. 481. Thw. Enum. 208. Clarke, l. c. 112. C. P. 1788.
Fl. B. Ind. iv. 356. Bot. Mag. t. 4182.

Stems much branched, hairy-pubescent; l. $2\frac{1}{2}$–4 in., ovate, rounded or subcordate at base, somewhat acuminate, acute, entire, finely silky-hairy on both sides, thin, petiole 1–2 in., hairy; fl. numerous, on short glabrous ped., in paniculate spreading cymes, peduncles 3–4 in., bracts ovate, caducous; cal. cut more than $\frac{3}{4}$ down, segm. linear-lanceolate, acute, glabrous; cor. about $1\frac{1}{2}$ in., limb 1 in. diam., glabrous, a third very small (posterior) staminode usually present; stigma peltate; capsule 3–4 in., very slender.

Var. β, **angusta,** *Clarke, l. c.* C. P. 3437.

L. smaller, lanceolate, tapering to base, less hairy, lat. veins fewer, fl. smaller.

Damp places in the forests of moist region up to 5000 ft.; rather common. Var. β in Singhe Rajah Forest, Kukul Korale; Morowak Korale. Fl. most of the year; fl. reddish-violet, tube white within, with a yellow line on lower side.
Endemic.
The colouring of the flowers in Bot. Mag. is inaccurate.

4. **CHAMPIONIA,*** *Gardn.*

Perennial herb, l. opp., fl. small in umbellate-paniculate axillary cymes; cal. very deeply cleft; segm. 5, almost distinct sep.; cor. rotate, tube very short, lobes 4, equal, spreading; stam. 4, inserted on cor.-tube, fil. short, equal, anth. not connate, short, ovate-oblong, cells confluent; disk 0; ov. 1-celled, placentas 2, T-shaped, stigma globose, small;

---

* Dedicated to Capt. (afterwards Col.) J. G. Champion, of H.M. 95th Regiment, who was in Ceylon 1838–47. (See Pt. ii. p. 3.)

capsule small, oblong, pointed, valves 2, each splitting into halves ; seeds minute, reticulate.—Monotypic and endemic.

C. reticulata, *Gardn. in Calc. Journ. Nat. Hist.* vi. 485 (1845). Thw. Enum. 208. Clarke, l. c. 133. C. P. 358 (370).
Fl. B. Ind. iv. 361. Clarke, Mon. Cyrt. t. 15.

Stem erect, 6–12 in., slightly branched, rough with shaggy hair especially above ; l. 3–5 in., lanceolate-oblong, much tapering at base, acute or subacute, entire, finely hairy on both sides but more so beneath, lat. veins numerous, oblique, conspicuous beneath, petiole $\frac{1}{2}$–$1\frac{1}{2}$ in., hairy ; fl. on rather long glabrous ped., numerous, cymes lax, irregularly trichotomous, peduncles often 2 from an axil, about 3 in., hairy, bracts linear, conspicuous ; cal.-segm. filiform, very acute, slightly hairy ; cor. $\frac{1}{2}$ in. diam., lobes ovate, obtuse, stam. exserted ; capsule about $\frac{3}{8}$ in., slightly pubescent.

Moist low country up to 3000 ft.; rare. 'South of the Island, abundant' (Thwaites); Sabaragamuwa Dist.; below Adam's Peak; Eratne, Kuruwita Korale. Fl. Feb., March, and Aug., Sept.; white.
Endemic.

5. KLUGIA, *Schlecht.*

Annual herbs with succulent stems ; l. alt., thin, very unequal at base, fl. moderate-sized, in stalked, one-sided terminal or leaf-opposed racemes, bracts small ; cal. campanulate, tube 5-angled, segm. 5, narrowly triangular ; cor.-tube cylindrical below, compressed and closed at the mouth, limb 2-lipped, upper lip very small, erect, lower lip large, flat, entire or faintly 3-lobed ; stam. 4, included, fil. equal, anth. all connate, cells short, confluent, staminodes (posterior stam.) very small, often absent ; disk annular or cup-shaped ; ov. 1-celled, with two T-shaped placentas ; capsule included in cal., ovoid, pointed, membranaceous, loculicidally 2-valved ; seeds truncate at ends, reticulate.—Sp. 4 ; 3 in *Fl. B. Ind.*

Posterior angle of cal.-tube produced into a large
crest . . . . 1. K. NOTONIANA.
All the angles of cal.-tube equally narrowly winged . 2. K. ZEYLANICA.

1. **K. Notoniana,** *A. DC. Prodr.* ix. 276 (1845). **Diyanilla,** *S.* Gardn. in Calc. Journ. Nat. Hist. vi. 487. Thw. Enum. 208. Clarke, l. c. 159. C. P. 1787.
Fl. B. Ind. iv. 366. Wight, Ic. t. 1353.

Annual, stem 1–2 ft., branched, stout, shining, semitransparent, glabrous or slightly hispid with few short bristly

hairs above, roots long, fibrous-fleshy; l. few, 5–8 in., on thick, succulent, transparent petioles like the stem, ovate-oval, very unequal-sided, acuminate, acute, minutely spinous-denticulate, smaller side acute at base, larger one semi-cordate, auriculate, extending much lower down on petiole, scabrous with minute prickles between the veins above, glabrous and paler beneath, lat. veins very numerous parallel, prominent on both sides; fl. on short alternate ped., nodding, raceme short, stalked, pubescent on one side only, bracts linear; cal.-tube 5-angled, angles ciliate, very slightly winged, the posterior one extended into a large, erect, rounded crest, lobes narrowly triangular, acute; upper lip of cor. of 2 minute triangular lobes, lower lip $\frac{3}{4}$ in., by over $\frac{1}{2}$ diam., entire; disk annular; style blunt; capsule as long as cal.

Var. β, **glabra,** *Clarke, l. c.* *K. glabra*, Gardn. l. c. 489. C. P. 3369.

Whole plant quite glabrous or the l. very slightly rough above, fl. smaller.

Wet shady places by streams in the montane zone, 3000–7000 ft.; common. Var. β, Dolosbagie; Pundalu-oya (E. Green). Fl. Sept.–April; rich purplish-blue, with a small yellow spot at base, upper lip white.

Also in S. India.

Var. β endemic.

Var. β is, perhaps, a separate species as Gardner considered it. It is sometimes very dwarf, with a single leaf and 2–4 flowers. Our common plant appears to be *K. scabra*, Dalz. and Gibs., which is not deserving of even varietal rank. Well worth cultivation.

2. **K. zeylanica,** *Gardn. in Calc. Journ. Nat. Hist.* vi. 490 (1845).
Thw. Enum. 208. Clarke, l. c. 160. C. P. 1786.
Fl. B. Ind. iv. 367. Bot. Mag. t. 4620 (*K. Notoniana*).

Annual, stem about 1 ft., slightly branched, stout, transparent, nearly glabrous, with a few minute stellate hairs chiefly in upper part, roots numerous, long, fibrous, from lower part of stem; l. 3–$4\frac{1}{2}$ in., ovate-oval, extremely unequal, the smaller side cuneate, the larger semi-cordate at base, shortly acuminate, acute, faintly repand-serrate or quite entire, slightly rough on both sides with minute forked hairs, lat. veins very numerous, parallel, prominent, petiole $\frac{1}{2}$–1 in., succulent; fl. nodding, on short slightly hairy ped., raceme lax, bracts linear, shorter than sep., peduncle longer than petiole, slightly pubescent; cal. $\frac{3}{8}$ in., tube sharply 5-angled, slightly hairy with forked hairs, all angles narrowly winged, segm. narrowly triangular, subacute; upper lip of cor. erose, not bifid, lower lip about $\frac{1}{2}$ in. diam., orbicular, flat; disk cupular; style rather dilated; capsule membranaceous.

Damp shady places by streams in the moist low country to 3000 ft.; common. Fl. June–August; bright purplish-blue, with a small yellow spot at base, upper lip white.

Endemic.

The flowers are rather smaller than in *K. Notoniana*, and of a rather paler purple-blue.

[*Rhynchoglossum zeylanicum*, Hook., is figured in Bot. Mag. t. 4195 (1845), where it is said to have been sent from Ceylon by Gardner. It is referred in Fl. B. Ind. iv. 367 to var. *parviflora* of *R. obliquum*, Bl., which is common in India and Malaya, but does not occur in Ceylon in a wild state. It is an occasional weed in the Botanic Gardens at Peradeniya, whence Gardner probably obtained it.]

6. EPITHEMA, *Bl.*

Annual, succulent, l. few, alt. and opp., fl. small in dense, scorpioid cymes; cal. campanulate, segm. 5, acute; cor.-tube short, limb distinctly 2-lipped, upper lip deeply 2-lobed, lower 3-lobed; stam. 2, fil. short, anth. connate, cells short, confluent, staminodes (anterior stam.) 2, large, curved; ov. 1-celled, with large T-shaped placentas; capsule included in cal., membranaceous, dehiscing by a lid; seeds numerous, stalked, oblong-ovoid, spirally striated.—Sp. 6; 1 in *Fl. B. Ind.*

E. carnosum, *Benth. Scroph. Ind.* 57 (1835), var. **zeylanicum,** *Clarke, Mon. Cyrt.* 178 (1883).

E. zeylanicum, Gardn. in Calc. Journ. Nat. Hist. vi. 492. Thw. Enum. 208. C. P. 2844.

Fl. B. Ind. iv. 369. Wight, Ic. t. 1354 (not good). Clarke, Comm. & Cyrt. Beng. t. 90.

Stem 3–12 in., slightly branched, with many filiform roots from the base, erect, succulent, rough with bristly hairs; l. few (sometimes only 1), the upper opp., sessile, the lower alt. petiolate, 2–6 in., ovate-oval, cordate or rounded at base, obtuse, more or less incised-serrate or nearly entire, covered on both sides with soft bristly hair; fl. on very short ped., densely crowded in close scorpioid cymes, peduncles solitary or 2–5 together, terminal (rarely axillary), 3–4 in., erect, slightly hairy, often fused with petiole or base of l., with a large cordate leafy bract at summit immediately beneath infl.; cal.-segm. narrowly lanceolate, acute, hairy; lobes of upper lip of cor. oblong, serrate, acute, of lower lip rounded, equal; capsule very small, globose.

In crevices of damp rocks in moist region from 2000–5000 ft.; rather rare. Dolosbagie; Hantane; Kadaganawa. Fl. Feb. and Aug., Sept.; bright pale blue.

Also in S. India and Burma (the type in the Himalaya and Khasia Mountains).

A remarkable plant, greatly varying in size. Clarke distinguishes a var. *hispida*, to which he refers the figure of Wight quoted above.

7. ISANTHERA, *Nees.*

Small undershrub, l. alt., fl. rather small, in paniculate axillary cymes; sep. 5, linear-lanceolate; cor. campanulate-rotate, tube very short, lobes 5, equal; stam. 4, equal, inserted at base of cor., anth. small, distinct, cells confluent, staminode (posterior stam.) 1, often absent; disk annular, inconspicuous; ov. 1-celled, arms of placentas recurved, style short, stigma capitate; fruit (not seen) a fleshy indehiscent or 2-valved capsule; seeds numerous, compressed, reticulate.—Sp. 3; 1 in *Fl. B. Ind.*

1. permollis, *Nees in Trans. Linn. Soc.* xvii. 82 (1834).
I. floribunda, Gardn. in Calc. Journ. Nat. Hist. vi. 483. Thw. Enum. 208. Clarke, l. c. 192. C. P. 1670.
Fl. B. Ind. iv. 372. Wight, Ic. t. 1355.

Stem about 1 ft., erect, stout, unbranched, with yellowish-white bark, bare below and marked with scars of l., tomentose with fulvous hair when young; l. alt., closely placed, 4–7 in., obovate-lanceolate, tapering into petiole, shortly acuminate, acute or subacute, slightly denticulate-serrate cottony-silky with fulvous hair on both sides when young, becoming glabrous above, petiole $\frac{1}{2}$–1 in.; fl. numerous, on densely silky-hairy ped., cymes short, paniculate, with divaricate branches, peduncle shorter than petiole, bracts linear, very silky; sep. very acute, densely silky-hairy; cor. $\frac{1}{2}$–$\frac{5}{8}$ in. diam.

Shady forests in the moist region 2000–4000 ft.; rather common. Adam's Peak (Moon, ex Gardner). Fl. April and Sept., October; white, anth. yellow.

Also in the Nilgiri Mountains and in Burma.

This plant has much the appearance of the species of *Neurocalyx* (Rubiaceæ). The corolla is very nearly regular, but the perfect stam. never more than 4.

XCVI.—BIGNONIACEÆ.

Trees, l. opp., compound, fl. usually large, in terminal racemes or panicles, bisexual, irregular; cal. free, campanulate or spathaceous, segm. 5 or 0; cor.-tube campanulate or

tubular, lobes 5, nearly equal, crisped, 2 upper usually somewhat connate into an upper lip; stam. 4, didynamous, or 5, anth. 2-celled, cells distinct; disk large, annular; ov. superior, 2-celled by coalescence of the parietal placentas, ovules numerous in many rows, stigma usually 2-bladed; fruit a large 2-valved compound capsule, septum large and thick, separating from valves; seeds very numerous, large, winged at both ends, without endosperm.

Our few (3) species of this large Tropical Order all inhabit the low country of the wet region.

L. 3- or 4-pinnate; stam. 5 . . .	1. OROXYLUM.
L. simply pinnate; stam. 4.	
Cal. large, spathaceous . . .	2. DOLICHANDRONE.
Cal. small, with short equal segm. .	3. STEREOSPERMUM.

1. **OROXYLUM,** *Vent.*

Small tree, l. few, opp., large, much compound; fl. very large, in large terminal racemes; cal. very large, campanulate, thick and fleshy, truncate or with shallow irregular segm., persistent; cor. thick and fleshy, tube campanulate, curved, limb 2-lipped, lobes 5, 2 upper partially connate, rounded, recurved, crumpled and crisped; stam. 5, inserted near base of tube, fil. unequal, posterior one shortest, anth.-cells long, distinct, pendulous from top of fil.; disk large, cushion-like, style long, stigma of 2 large leafy blades; capsule very large, broadly linear, strongly compressed parallel to septum, 2-valved; seeds flattened, with a very wide hyaline wing.—Monotypic.

O. indicum, *Vent. Dec. Gen. Nov.* 8 (1808). **Totila,** *S.*
Herm. Mus. 48. Fl. Zeyl. n. 236. *Bignonia indica*, L. Sp. Pl. 603. *Spathodea indica*, Pers., Moon Cat. 45. *Calosanthes indica*, Bl., Thw. Enum. 206. C. P. 3171.
Fl. B. Ind. iv. 378. Wight, Ic. t. 1337–8.

Usually small, but attaining sometimes to 30 or 40 ft., branched only at top, bark thick, yellowish-grey, rather smooth, with numerous large corky lenticels, l. extremely large, 3–5 ft., triangular in outline, tri- or quadripinnate with opp. pinnæ, rachis very stout, cylindrical, much swollen at the branches, rough with corky lenticels, primary pinnæ about 5 pair, lflts. numerous, shortly petiolate, $2\frac{1}{2}$–$4\frac{1}{2}$ in., broadly oval or nearly rotundate, rounded at base, suddenly and shortly caudate-acuminate, obtuse, glabrous, paler beneath; fl.

numerous, on very stout glabrous spreading ped. $2\frac{1}{2}$–3 in., long and articulated at base, arranged in very large erect racemes 1–2 ft. or more long, peduncle very stout, branch-like, bracts fused with ped.; cal. $1\frac{3}{4}$ in., oblong-campanulate, glabrous; cor.-tube $2\frac{1}{4}$ in., mouth about $1\frac{1}{2}$ in. diam., limb about 4 in., lobes much crumpled in bud, thickly covered on both sides with papillose hairs; fil. cottony at base; ov. oblong, somewhat compressed, glabrous; capsule 2–$2\frac{1}{2}$ ft. or even more by $3\frac{1}{2}$–4 in. wide, tapering to both ends, flat, acute, valves semi-woody, thin; seeds very numerous, oval, wing extending all round except at base, $2\frac{1}{2}$ in. diam.

Moist low country below 2000 ft.; common. Fl. July, August; dull pale pinkish-yellow, reddish-purple outside.

Throughout India, Burma, Malaya, and Cochin China.

A weedy little tree, very conspicuous owing to its enormous capsules often nearly 3 ft. long. The coarse flowers have a somewhat fetid odour. A drawing only of Hermann's, no specimen.

The bark is much used as an astringent tonic.

Millingtonia hortensis, L. f., the Indian Cork Tree, is commonly planted for the sake of its white fragrant blossoms. It is common in Tropical gardens, and is said to have been found wild in Burma. I have never seen fruit in Ceylon.

Spathodea campanulata, Beauv., native of Tropical Africa, has been much planted as an ornamental quick-growing tree. I have known it to fruit once only, in April, 1892, in Kandy.

2. **DOLICHANDRONE,** *Seem.*

Tree, l. opp., pinnate, fl. very large, few, in terminal corymbs, cal. large, cleft down one side to the base (spathaceous), caducous; cor.-tube very long, inflated in upper part, lobes 5, nearly equal, crisped at margin; stam. 4, didynamous, anth. very large, disk annular, cushion-like; ov. 2-celled, ovules very numerous, stigma clavate; capsule large, cylindrical-compressed, linear, curved, spuriously 4-celled, valves thin; seeds very numerous, much compressed, prolonged at each end into a thick flat, blunt truncate corky wing.—Sp. 12; 6 in *Fl. B. Ind.*

D. Rheedii, *Seem. Journ. Bot.* viii. 380 (1870). **Diya-danga,** *S.* **Vilpadri,** *T.*

Bignonia spathacea, L. f. Suppl. Pl. 283. *Spathodea longiflora*, Vent., Moon Cat. 45. *S. Rheedii*, Wall., Thw. Enum. 206. C. P. 3170.

Fl. B. Ind. iv. 379. Wight, Ic. t. 1339.

A tree about 30 ft. high, branchlets stout, marked with prominent leaf-scars, lenticellate, young shoots glabrous; l. imparipinnate, rachis 8–12 in., swollen at base and joints,

cylindrical, channelled above, glabrous, lfts. 7 or 9 (3 or 4 pair and terminal one), articulated, distant, shortly stalked, 4–6 in., ovate-lanceolate, usually rounded, often unequal-sided at base, acuminate-caudate, entire, glabrous and shining, veins prominent beneath, often purple; fl. 3 or 4 together on short, stout, erect ped.; cal. over 2 in., completely closed and with a curved beak in bud, afterwards splitting to base, deciduous by a circular fission at base; cor.-tube 6 in., cylindrical, upper part funnel-shaped, limb 2½–3 in. diam., lobes rounded, much crisped and crenate on margin; capsule about 18 in., ovoid on section, bluntly pointed, smooth, purplish-brown; seeds overlapping in many rows, ⅝ in., flat, rectangular, white.

Moist low country, chiefly near the coast, and especially in mangrove swamps. Kalutara; Panadure; Galle. Fl. May, July; white.

Also in the Malabar Coast, Andaman Is., and Malaya.

Ceylon specimens from Kœnig are in Herb. Mus. Brit. These are referred by Seemann (l. c. 382) to *D. crispa*, Seem., a closely allied species; they are the type for *Bignonia spathacea*, L. f. The bruised leaves have an aromatic but disagreeable odour. The wood is soft, light, and white, and used for floats, models, &c.

3. **STEREOSPERMUM,** *Cham.*

Large tree, l. pinnate, fl. rather small, in terminal panicles; cal. narrowly campanulate, segm. 5, short, 2 often connate; cor.-tube tubular-campanulate, curved, lobes 5, nearly equal, crisped at margin, two upper partially connate; stam. 4, nearly equal, anth. not connate, cells divaricate, staminode (barren 5th stam.) very short; disk thick, annular, stigma thickened, 2-bladed; capsule very long, linear, subquadrangular with 2 sharp edges, septum very much thickened, cylindrical; seeds numerous in excavations of the septum, with a long wing at each end and a deep transverse furrow across centre.—Sp. 10; 9 in *Fl. B. Ind.*

S. chelonioides, *DC. Prod.* ix. 210 (1845). **Lunu-madala, Dunu-madala,** *S.* **Padri,** *T.*

Bignonia salina, Moon Cat. 45. Thw. Enum. 206. C. P. 1959. Fl. B. Ind. iv. 382. Wight, Ic. t. 1341. Bedd. Fl. Sylv. t. 72.

A large tree, with many spreading branches, bark thick, rough, yellowish, young parts glabrous; l. imparipinnate, stalked, rachis 6–8 in., thickened and kneed at the base and joints, channelled above, slightly lenticellate, glabrous, lflts. 5 or 7 (2 or 3 pair and a terminal one), 4–6 in., on petioles about ¾ in. long, oval, rounded or acute and often unequal at

base, narrowly caudate, very acute, entire, glabrous, rather stiff, with copious, pellucid finely reticulate venation; fl. on slender glabrous articulated ped., in lax drooping, stalked, terminal panicles with articulated branches, bracts minute, soon falling; cal. $\frac{3}{8}$ in., glabrous, purple, cor. nearly 1 in., limb $\frac{3}{4}$ in. diam., upper part woolly within and with tufts of woolly hair below insertion of stam., lobes rounded; style curved, included; capsule 1–2 ft., by $\frac{3}{4}$ in. wide, glabrous, usually dotted with white, valves thin, flexible, septum spongy, almost filling cavity; seeds about $1\frac{1}{4}$ in., readily splitting along the transverse furrow.

Moist low country, chiefly on the coast, but extending up to 2000 ft.; common. Fl. May, June; pinkish-yellow or cream-coloured, veined and stained with reddish-purple.

Also in India and Burma.

Wood rather heavy, hard, yellowish-grey, durable. The bark is used as a substitute for the Palol bark of the bazaars (see below).

S. suaveolens, DC., is a planted tree, especially about Buddhist temples, and is called 'Palol' or 'Ela-palol.' It has rather handsome dull purple sweet-scented flowers, very copiously produced in May and June. It is C. P. 1960. A native of India, the bark of which is a favourite tonic medicine.

XCVII.—PEDALIACEÆ.

ANNUAL herbs, l. opp. or alt., fl. bisexual, irregular, rather large, axillary; cal. free, segm. 5; cor. tubular-ventricose, obscurely two-lipped, lobes 5, unequal, imbricate; stam. 4, didynamous; ov. superior, 2- (or falsely 4-) celled, ovules 2 or many, superposed, stigmas 2; fruit a 2-valved capsule or indehiscent; seeds without wings, no endosperm.

Fruit indehiscent, spiny . . . . 1. PEDALIUM.
Fruit a 2-valved capsule, unarmed . . 2. SESAMUM.

1. **PEDALIUM,** *L.*

Annual herb., l. opp., fl. rather large, solitary; cal. small, segm. 5; cor.-tube rather slender, limb obscurely 2-lipped, 5-lobed, lowest lobe the largest; stam. 4, didynamous, anth. not connate; ov. 2-celled with 2 superposed ovules in each cell, stigmas 2; fruit hard, indehiscent, narrowed below, ovoid above, with a sharp point and 4 horizontal sharp spines from the sides; seeds pendulous.—Monotypic.

P. Murex, *L. Syst. Nat.* x. 580 (1759). **Et-nerenchi,** *S.* **Peru- or Ánai-nerinchi,** *T.*

Herm. Mus. 42. Burm. Thes. 122. Fl. Zeyl. n. 440. Moon Cat. 46. Thw. Enum. 209. C. P. 1779.

Fl. B. Ind. iv. 386. Wight, Ic. t. 1615.

Stems decumbent, much branched, thick, slightly rough with scaly glands or hairs, l. opp., 1–1½ in., broadly oval-oblong, acute at base, truncate or obtuse, very coarsely crenate-serrate or lobed, glabrous above, covered with minute scaly glands beneath, rather fleshy, pale glaucous green, petiole ¼–½ in.; fl. on very short curved ped.; cal.-tube very short and wide, segm. linear, spreading; cor.-limb nearly 1 in. diam., lobes broad, throat hairy within; fil. glandular-hairy at base; fruit ½–¾ in., narrowed below into a short thick stalk, broadly ovoid, bluntly 4-angled with the spines from the angles, pericarp very tough, fibrous-woody.

Sandy places near the sea, principally in the dry region, where it is common. Fl. Feb.–July; sulphur-yellow.

Also in S. India and Trop. Africa.

Hermann gives the native name 'Patiriya' for this, which, he says, means the iron caltrops used in warfare. The spined fruits are the cause of many wounds to the feet of the natives.

By soaking, a mucilaginous mass is formed in the water, which is a popular demulcent medicine.

Martynia diandra, Glox., a large strong-smelling annual with beautiful flowers, is quite naturalised and common in the dry region, where it is called 'Naka-tali,' T. It is native to Mexico. The hard woody fruits with strong curved spines are known as 'Tiger's claws.'

2. SESAMUM, *L.*

Annual herb, l. opp. below, alt. above, fl. rather large, axillary, solitary; cal. deeply cut into 5 nearly distinct segm.; cor.-tube ventricose, mouth oblique, lobes 5, unequal, lowest much the largest; stam. 4, didynamous, included, anth. not connate; ov. 2- (falsely 4-) celled, with many superposed ovules in two rows in each cell; stigmas 2; fruit a capsule, loculicidally 2-valved, seeds numerous.—Sp. 10; 3 in *Fl. B. Ind.*

***S. indicum,** *L. Sp. Pl.* 634 (1753). **Tel-tala,** *S.* **Eḷḷa,** *T.*

Burm. Thes. 87. Fl. Zeyl. n. 237. *S. orientale*, L. Sp. Pl. 634. Moon Cat. 46. Thw. Enum. 209. C. P. 2023.

Fl. B. Ind. iv. 387. Wight, Ill. t. 163.

Stem erect, 1–2 ft., puberulous with long ascending branches from the base, l. opp. below, the upper ones usually alt., 1½–2½ in., variable, the upper lanceolate, entire, the lower

often deeply cut (even to midrib) at the base into 2 or more serrate segm., glabrous above, puberulous beneath with minute scaly hairs; fl. on very short, erect, puberulous ped.; cal. pubescent; cor. pubescent outside, glabrous within; capsule $\frac{3}{4}$ in., oblong, bluntly quadrangular, shortly beaked, pubescent, valves separating for about half way down, gaping; seeds oblong, slightly compressed, glabrous, black or white.

A weed in waste grounds and by roadsides, but generally the result of cultivation, and not, I think, indigenous to Ceylon. Much cultivated in the dry region. Fl. pale pinkish-purple.

In all hot countries; native in Trop. Africa (?).

The seeds afford Gingelly oil, and the plant is much cultivated in the dry region. *S. orientale*, L., differs only from *S. indicum*, L., in having all the leaves entire—a quite trifling distinction.

S. occidentale, Heer & Regel, is a common weed in waste places about Colombo and elsewhere. It is C. P. 3852, and given in Thw. Enum. 442. In Fl. B. Ind. this is made a synonym of *S. indicum*, but seems a distinct species or a well-marked race, no doubt spread from the Botanic Gardens. Its origin is said to be S. American, but this may be doubted.

XCVIII.—ACANTHACEÆ.

HERBS or shrubs (stem twining in *Thunbergia*), l. opp., simple, without stip.; fl. bisexual, irregular, large or small, axillary or in heads or spikes, each usually with a bract and 2 bractlets at base; cal. free, segm. or sep. 4 or 5 (numerous in *Thunbergia*) sometimes unequal; cor. usually 2-lipped (upper lip wanting in 12 and 13), tube long or short, lobes 5, imbricate or contorted in bud; stam. 4 or 2, anth. 2-celled (1-celled in *Monothecium*), cells sometimes superposed; ov. superior, 2-celled, with 2 or numerous ovules in each cell, style usually bifid; fruit a loculicidal 2-valved capsule, often with a solid base; seeds hard, usually compressed, often covered with fine white adpressed hairs which become erect when wetted, usually supported on erect often curved and sharp processes (*retinacula*).

Of this very large Tropical family we possess 93 species, of which the large proportion of 38 are endemic. The majority of the Ceylon genera are confined to the low country, and are especially noticeable in the dry region, where are found 50 species, 23 of them restricted to it. But a

striking exception occurs in our largest genus, *Strobilanthes*, 18 out of its 28 species being found only in the hills, whilst, of the 5 which are confined to the low country, 2 only occur in the dry districts.

Stems twining: sep. 12–20, toothlike . . .	1. THUNBERGIA.
Stems not twining; sep. 4 or 5.	
Ovules numerous in 2 rows in each cell, no retinacula.	
Cal.-segm. 4; stam. 2	2. ELYTRARIA.
Cal.-segm. 5; stam. 4	3. EBERMAIERA.
Ovules 3–12 or 2 in each cell, seeds with retinacula.	
Ovules 3–12 in each cell; capsule 6- or more seeded.	
Cor.-lobes contorted in bud.	
Cor. distinctly 2-lipped.	
Fl. small; retinacula minute, straight	4. CARDANTHERA.
Fl. large; retinacula long, slightly curved	5. HYGROPHILA.
Cor.-lobes nearly equal.	
Capsule clavate, with a solid base .	7. RUELLIA.
Capsule oblong, without a solid base .	10. STENOSIPHONIUM.
Cor.-lobes imbricate in bud.	
Seeds not compressed	18. ANDROGRAPHIS.
Seeds much compressed . . .	19. GYMNOSTACHYUM.
Ovules 2 in each cell; capsule 4- or fewer seeded.	
Cor.-lobes contorted in bud.	
Stam. 4.	
Cal.-segm. equal	6. CALOPHANES.
One cal.-segm. much largest . .	8. PHAYLOPSIS.
Stam. 2; cor.-tube very long, linear .	9. DÆDALACANTHUS.
Stam. 2 or 4; cor.-tube campanulate above	11. STROBILANTHES.
Cor.-lobes imbricate in bud.	
Cor.-lobes nearly equal.	
Stam. 4.	
Bracts large; cor. split down back .	15. CROSSANDRA.
Bracts inconspicuous; cor. not split	16. ASYSTASIA.
Perfect stam. 2.	
Sep. 4 in opp. pairs	14. BARLERIA.
Sep. 5	17. ERANTHEMUM.
Cor. distinctly 2-lipped.	
Stam. 4	20. LEPIDAGATHIS.
Stam. 2.	
Anth. 1-celled	21. MONOTHECIUM.
Anth. 2-celled.	
Placentas not separating from capsule.	
Anth.-cells more or less superposed.	
Anth. spurred at base . .	22. JUSTICIA.
Anth. pointed at base . .	23. ADHATODA.
Anth. blunt at base . .	24. RHINACANTHUS.

Anth.-cells parallel.
Bracts inconspicuous, scattered . . . . . 25. PTYSSIGLOTTIS.
Bracts large, imbricate . . 26. ECBOLIUM.
Placentas separating from base of capsule.
Bracts imbricated in four ranks 27. RUNGIA.
Bracts in adpressed pairs. . 28. DICLIPTERA.
Cor. without an upper lip.
Seeds 2 . . . . 12. BLEPHARIS.
Seeds 4 . . . . 13. ACANTHUS.

1. THUNBERGIA,* *L. f.*

Perennial, with twining stems, l. angled, fl. rather large, solitary, axillary, bracts none, bractlets very large, completely enclosing bud; sep. small, 12–20 in a ring; cor.-tube narrow, ventricose, laterally compressed, lobes 5, large, nearly equal, contorted, overlapping to left; stam. 4, didynamous, distinct, included, disk annular, ovules 2 in each cell, collateral, stigma dilated, 2-lobed; capsule didymous, terminated by a long sword-shaped obtuse empty beak; seeds 2 in each cell, nearly globose, without retinacula.—Sp. 30; 10 in *Fl. B. Ind.*

T. fragrans, *Roxb. Pl. Corom.* i. 47 (1795).
Moon Cat. 46. Thw. Enum. 224. C. P. 2020.
Fl. B. Ind. iv. 390. Roxb. Pl. Corom. t. 67. Bot. Mag. t. 1881.

Stems slender, long, twining, dilated at nodes, rough with deflexed hair; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., deltoid-ovate, obtuse, apiculate, with a few large angular apiculate lobes at the base, very finely hispid on both sides, petiole $\frac{1}{2}$–$1\frac{1}{4}$ in., divaricate, stiff, channelled above, hispid with deflexed hairs; ped. 1–2 in. long, hispid, bractlets over 1 in., ovate, acute, pubescent; sep. about $\frac{1}{8}$ in., cor.-tube about 1 in., pubescent outside, limb $2\frac{1}{2}$ in. diam., lobes truncate, coarsely toothed; capsule a little over 1 in., glabrous, much compressed, 2-valved; seeds $\frac{1}{6}$ in., glabrous, brown mottled with black.

Var. β, **vestita,** *Nees in DC. Prod.* xi. 57.

Whole plant much more hispid; capsule pubescent.

Var. γ, **parviflora,** *Trim. in Journ. Bot.* xxvii. 165.

L. glabrous, smaller, more deeply cut, very acute, bractlets narrower, glabrous; cor.-limb. under 1 in. diam.

---

* In memory of Charles Peter Thunberg, Prof. of Botany at Upsala University, the celebrated botanical traveller, who visited S. Africa, Java, and Japan. He was in Ceylon in 1777–8. Died 1822.

Grassy places in all parts of the island up to 7000 ft.; common. Var. *β*, Lagalla. Var. *γ*, summit of Ritigala. Fl. all the year; pure white.

Throughout India, Malaya, Burma, Philippines, Trop. Australia.

The flowers never have the slightest scent. Roxburgh bestowed the name *fragrans* from 'a peculiar and agreeable fragrance of the plant,' which I am unable to detect; he expressly says that the flower is scentless.

T. alata, Boj., is a very common weed among grasses in the moist region up to 5000 ft. Its pretty flowers—orange-yellow, pale yellow, or milk-white, with the tube purple-black and hairy within—are abundant throughout the year, the plant being completely naturalised. It is a native of Africa, and probably originated here from the Bot. Gardens.

[*T. Hawtayneana*, Wall., is given for Ceylon on the authority of a specimen from Mrs. Walker in Herb. Kew. It was probably from S. India, or perhaps was cultivated here.]

[*T. coccinea*, Wall., is a plant of the E. Himalaya, &c. It was sent from Ceylon by Macrae, but the specimens were from the Botanic Gardens.]

2. **ELYTRARIA,** *Vahl.*

Perennial herb, l. alt., subradical, fl. small, in dense spikes terminating radical scapes, bracts ovate, imbricate, bractlets linear; sep. 5, very small, linear, slightly connate below, one broader and two narrower than other two; cor.-tube longer than sep., limb 2-lipped, upper lip notched, lower lip broad, 3-lobed; stam. 2, anth.-cells slightly spurred at base; staminodes 2, short; ovules 10 in each cell, superposed in 2 rows, stigma large, slightly bilobed; capsule ovoid, acute; seeds minute, papillose, without retinacula.—Sp. 3 or 4; 1 in *Fl. B. Ind.*

E. crenata, *Vahl, Enum.* 106 (1805).
Moon Cat. 3. Thw. Enum. 224. C. P. 240.
Fl. B. Ind. iv. 394. Roxb. Pl. Corom. t. 127 (*Justicia acaulis*).

Rootstock short, erect, occasionally branched, l. alt., mostly radical, erect or spreading on ground, 2–5 in., spathulate-oval or -oblong, tapering below, obtuse, nearly entire or shallowly crenate, often runcinately lobed in lower part, glabrous above, pilose on the veins and pale or silvery beneath, petiole rather long, hairy; fl. sessile, crowded, scapes usually exceeding l., erect, stiff, slender, covered with adpressed, imbricate, acuminate bracts, floral bracts longer than sep., ovate, sharply acuminate, glabrous but ciliate on margin, bractlets linear, ciliate; sep. rather longer than bractlets, oblong-linear, glabrous, obtuse, thin; lobes of lower lip of cor. bifid; valves of capsule recurved.

Var. *β*, **lyrata,** *Vahl, l. c.* (sp.). Moon Cat. 3.

L. smaller, deeply pinnatisect with a terminal lobe; bracts broader.

In turf, damp waste ground, &c., in low country; common. Fl. Feb., March, September; white.

Also in India, Trop. and S. Africa, and America.

Nelsonia campestris, Br. (*N. tomentosa*, Nees).—A specimen of this in Herb. Kew from Mrs. Walker is labelled as from Ceylon. Hence it is included in Thw. Enum. 224. It is not unlikely to occur, as it is common in India; but no one else has met with it.

3. EBERMAIERA, *Nees.*

Herbaceous, l. opp., fl. small, in terminal or axillary spikes and solitary, bracts apiculate, strongly 1-nerved, bractlets as long as bracts, linear; sep. 5, four linear, subulate, the other wider and longer; cor.-tube cylindrical, lobes 5, short, nearly equal; stam. 4, didynamous, included, anth.-cells ovoid, distinct, not appendaged; ovules numerous in each cell, stigma with 2 unequal lobes, the lower one bifid; capsule small; seeds numerous, subglobose, without retinacula. —Sp. 40; 28 in *Fl. B. Ind.*

E. zeylanica, *Nees in DC. Prod.* xi. 74 (1847).

E. glauca, And. in Thw. Enum. 224 (non Nees). And. in Journ. Linn. Soc. ix. 451. C. P. 2717, 3575.

Fl. B. Ind. iv. 397.

Stem erect, 3–6 in., usually with long procumbent branches from the base, densely but shortly hairy; l. of the main stem 1½–3 in. of the branches ½–1½ in., petioled, oval, narrowed to base, obtuse, pubescent, paler beneath; fl. usually in rather dense spikes 1–2 in. long, bracts and bractlets covered with long bristly glandular hair; sep. a little shorter, with similar hair; cor.-lobes rounded; stam. hairy; ov. glabrous; capsule $\frac{1}{6}$ in., oval-oblong, smooth; seeds at first glandular.

Low country; rare. Near Kandy (Macrae); Ambagamuwa and Sabaragamuwa Dists.; Batticaloa. Fl. Feb.–March; pale pink.

Also in S. India.

4. CARDANTHERA, *Ham.* (in B. & H. Gen.).

Annuals, l. opp., often toothed or cut, fl. small, in spikes or whorls or rarely solitary, bracts and bracteoles nearly equal (absent in *C. Thwaitesii*); sep. 5, narrow, one usually larger than the rest; cor.-tube short, ventricose above, limb 2-lipped, lips long, upper one bifid, lower one shortly 3-toothed and transversely ridged (except in *C. Thwaitesii*), lobes contorted

in bud; stam. 4, didynamous, or 2, slightly exserted; capsule narrow, slightly compressed, without a solid base; seeds 10 or more in each cell, retinacula minute, straight, soft.—Sp. 10; 8 in *Fl. B. Ind.*

Stam. 4.
  Fl. in terminal spikes . . . . 1. C. ULIGINOSA.
  Fl. in axillary whorls.
    Erect, stem and l. glabrous, or nearly so. . 2. C. BALSAMICA.
    Prostrate or ascending, stem and l. pubescent 3. C. VERTICILLATA.
Stam. 2; fl. solitary, axillary . . . . . 4. C. THWAITESII.

1. **C. uliginosa,** *Ham. in Fl. B. Ind.* iv. 403 (1884).
Adenosma uliginosa, 'R. Br.,'* Thw. Enum. 224. And. in Journ. Linn. Soc. ix. 455.
Fl. B. Ind. iv. 403.

Stem 1–1½ ft., erect or decumbent, pubescent upwards; l. subsessile, 1 in., oblong or slightly ovate, entire or crenate, glabrous or subpubescent; fl. in terminal spikes 1–3 in. long, bracts 4-ranked, imbricate in fruit, rotund-ovate, cordate at base, bractlets $\frac{1}{5}$ in., obovate; sep. $\frac{1}{3}$ in., linear, pubescent, cor. $\frac{1}{3}$ in., puberulous; stam. 4, anth. of posterior pair very small; capsule $\frac{1}{5}$ in.

In paddy fields; very rare. Only known from specimens in Herb. Kew collected by Walker.
Also in S. India.
I have not seen this; the description is taken from Fl. B. Ind.

2. **C. balsamica,** *Clarke in Fl. B. Ind.* iv. 404 (1884).
Adenosma balsamea, Spr., Thw. Enum. 224. And. in Journn. Linn. Soc. ix. 454. C. P. 1996.
Fl. B. Ind. iv. 404. Wight, Ic. t. 446.

Stem 12–18 in., erect, rather slender, glabrous, puberulous above, with long ascending branches; l. $\frac{3}{4}$–1½ in., linear-lanceolate or lanceolate, acute, much tapering into short petiole, slightly serrate, glabrous above, a little pubescent beneath; fl. sessile, 1–4 in axils of l. so as to form whorls, bracts and bractlets lanceolate, acute, pubescent, the latter smaller; sep. a little longer than bracts; stam. 4.

Dry region, in paddy fields and wet places; apparently rare. Karamunai, E. Prov. (Gardner). Fl. Feb.
Also in S. India.

3. **C. verticillata,** *Clarke in Fl. B. Ind.* iv. 404 (1884).
Adenosma verticillata, Nees, Thw. Enum. 224. And. in Journ. Linn. Soc. ix. 454. C. P. 1995.
Fl. B. Ind. iv. 404. Wight, Ic. t. 1524.

---

* Brown has no such species; the combination is of Nees.

Stems stout, ascending or prostrate, often rooting at the nodes and much branched from the base, pubescent; l. numerous, sessile or obscurely petioled, $\frac{1}{2}$–2 in., oblong-lanceolate, tapering to both ends, serrate, the lower ones often deeply pinnately lacerate, usually pubescent on both sides; fl. sessile, 1–3 in axils, forming dense whorls, bracts and bractlets lanceolate, acute, finely pubescent; sep. rather longer than bracts, linear, acute, glandular-pubescent; cor. pubescent outside, tube exserted, narrow and cylindrical below, widely dilated above, lower lip 3-toothed or nearly entire, hairy within; stam. 4; capsule about $\frac{1}{4}$ in., linear, pubescent; seeds minute.

Paddy fields, borders of tanks and damp sandy ground in the dry and intermediate regions; common. Fl. March and July, August; pale pinkish-violet.

Also in S. India.

I do not think this is really distinct from *C. balsamica.* It is sometimes viscid, and in dry places is often dwarf and congested. Has much the look of a Scrophulariaceous plant.

4. **C. Thwaitesii,** *Benth. in Gen. Pl.* ii. 1075 (1876).
Adenosma Thwaitesii, T. And. in Thw. Enum. 224. C. P. 1994.
Fl. B. Ind. iv. 405.

Stem 4–12 in., erect, much pyramidally branched, viscid-pubescent; l. numerous, on main stem 1–1$\frac{1}{2}$ in., on branches $\frac{1}{4}$–$\frac{3}{4}$ in., oval or lanceolate, somewhat spathulate, tapering to very short petiole, obtuse or subacute, pubescent on both sides, paler beneath; fl. small, numerous, nearly sessile, solitary, distant, in the forks of a lax, much branched, leafy, paniculate dichotomous cyme, floral bracts and bractlets absent; sep. $\frac{1}{6}$ in., narrowly linear, pubescent, one usually longer; cor. very small; stam. 2; capsule $\frac{1}{4}$ in., glabrous; seeds numerous, retinacula very short.

Dry region; rare. Batticaloa District, abundant (Thwaites); Karamunai (Gardner). Fl. March.

Endemic.

Forms a very distinct sub-genus, *Plæsianthera*, Clarke, which ought rather to be considered distinct from *Cardanthera.*

5. HYGROPHILA, *Br.*

Herbs, l. opp. or whorled in threes and these with spines in the axils, fl. rather large, sessile or nearly so, in few-flowered axillary whorls, bracts and bractlets usually oval or lanceolate; sep. 4 or 5, often more or less combined into tubular cal.; cor.-tube funnel-shaped above, limb deeply

2-lipped, lobes long, contorted in bud; stam. 4, didynamous; capsule linear, not compressed, without a solid base; seeds numerous (few in *H. spinosa*) ovoid, covered with elastic hygroscopic hair, retinacula, long, slightly curved, sharp.—Sp. 18; 8 in *Fl. B. Ind.*

Sep. 5, more or less connate into a cal.
  Capsule slightly longer than sep. . . . 1. H. SALICIFOLIA.
  Capsule twice as long as sep. . . . . 2. H. QUADRIVALVIS.
Sep. 4, distinct . . . . 3. H. SPINOSA.

1. **H. salicifolia,** *Nees in Wall. Pl. As. Rar.* iii. 81 (1832).
H. quadrivalvis, var., And. in Thw. Enum. 225. C. P. 591, 3109.
Fl. B. Ind. iv. 407. Wight, Ic. t. 1490.

Erect, often much branched from base, stems 1–2 ft., sub-quadrangular, slightly thickened at nodes, with very fine adpressed pubescence; l. variable, $\frac{3}{4}$–$2\frac{1}{2}$ in., nearly sessile, linear or lanceolate-oblong, tapering to both ends, subacute or obtuse, glabrous, entire or faintly crenate-serrate; fl. sessile in dense opp. axillary clusters forming rather distant whorls, bracts and bractlets lanceolate, acute, bristly on margins; sep. 5, equal, longer than bractlets, more or less connate, linear, very acute, slightly hairy; cor. pubescent outside and on lower lip within; capsule $\frac{1}{2}$ in., slightly exceeding sep.; seeds about 20, globose-ovoid, slightly compressed, retinacula very slightly curved.

Damp places in the low country to 2000 ft.; common. Fl. Feb., March, pale purple.
Also in India.

2. **H. quadrivalvis,** *Nees in Wall. Pl. As. Rar.* iii. 80 (1832).
Ruellia undulata, Vahl, Moon Cat. 46. Thw. Enum. 225. C. P. 2993.
Fl. B. Ind. iv. 408. Wight, Ic. t. 1489 (*H. obovata*).

Stem $1\frac{1}{2}$–3 ft., stout, sub-quadrangular, glabrous, lineolate; l. larger than in *H. salicifolia*, 2–5 in., more distinctly petiolate; fl. as in that species, but sep. connate for $\frac{2}{3}$ of their length; capsule $\frac{3}{4}$ in., about twice as long as cal.; otherwise as in the last.

Wet places in the moist low country; rather common. Galle; Kalutara; Colombo. Fl. December, January.
Also in India and Malay Peninsula.
This is scarcely separable as a species from the last.

3. **H. spinosa,** *And. in Thw. Enum.* 225 (1860). **Katu-ikiri,** *S.* **Nirmulli,** *T.*
Barleria longifolia, L., Moon Cat. 46. Thw. Enum. 225. C. P. 2900.
Fl. B. Ind. iv. 408. Wight Ic. t. 449 (*Asteracantha longifolia*).

Perennial (?) with an ascending rhizome, stems numerous,

2–4 ft., erect, nearly unbranched, somewhat compressed, thickened at nodes, hispid with long hair below each node; l. sessile, 6 at a node, 2 outer 4–5 in., 4 inner about $1\frac{1}{2}$ in., each having a nearly straight sharp yellow spine about 1 in. long in the axil, tapering to both ends, sparsely hispid on both sides, spinous-ciliate; fl. 8 (in 4 pairs) at each node, bracts like the l. but smaller, bractlets linear, hyaline below, bristly-hairy on back; sep. 4, shorter than bractlets, equal, narrow but one much broader than the rest, hyaline, with long hair outside; cor. glabrous, lobes oblong, truncate.

Wet places in the low country; common. Fl. Sept., Oct., Jan.; bright purple-blue.

Also in India.

The flowers are occasionally white. The root and whole plant are much used as a diuretic and tonic medicine.

6. **CALOPHANES,** *D. Don.*

Small, perennial, often shrubby, l. opp., small, toothed, fl. axillary, bracts and bractlets usually absent; cal. tubular, segm. 5, equal, acute; cor. narrowly cylindrical below, funnel-shaped above, obscurely 2 lipped, lobes 5, nearly equal, rounded, contorted in bud; stam. 4, didynamous; ovules 2 in each cell; capsule with a short solid base, clavate-oblong; seeds 4, orbicular, much compressed, covered with elastic hygroscopic hair, retinacula hard, sharp.—Sp. 30; 4 in *Fl. B. Ind.*

Cal.-segm. subulate, nearly as long as cor. . . 1. C. NAGCHANA.
Cal.-segm. lanceolate, not half as long as cor. . . 2. C. LITTORALIS.

1. **C. Nagchana,** *Nees in DC. Prod.* xi. 109 (1847). **Paḍuvan̤,** *T.*
C. depressa, And. in Thw. Enum. 225. C. P. 3537.
Fl. B. Ind. iv. 410. Burm. Fl. Ind. t. 41, f. 3 (*Ruellia erecta*).

Perennial herb often woody at the base, stems numerous, with many divaricate branches often prostrate and rooting at the nodes, sub-quadrangular, usually glabrous; l. $\frac{1}{2}$–1 in., broadly oval or nearly rotundate, tapering to very short petiole, rounded or truncate, usually denticulate, glabrous; fl. nearly sessile, 1–4, in axillary clusters; cal.-tube narrow, segm. as long as tube, subulate, pubescent; cor. under $\frac{1}{2}$ in., scarcely exceeding cal.; cor.-lobes oblong, obtuse, spreading; capsule about $\frac{1}{2}$ in., rather longer than enlarged cal., linear, acute; seeds broadly oval.

Sandy damp places in the dry region; rather common. Trincomalie; Batticaloa; Kekirawa; Atakalan Korale. Fl. March, April, and Aug., Sept.; pale violet-pink.

Also in Peninsular India.

2. **C. littoralis,** *And. in Thw. Enum.* 225 (1860). **Paraddai,** *T.* C. P. 1997.

Fl. B. Ind. iv. 410. Wight, Ic. t. 447 (*Dyschoriste littoralis*).

A small depressed undershrub, much divaricately branched, bark pale yellowish-grey or quite white; l. small, about $\frac{1}{4}$ in., on very short petioles, obovate, rounded or emarginate, with a few coarse dentations, glabrous, rather thick; fl. moderate-sized, nearly sessile, solitary, axillary, bractlets when present like the l., but smaller; cal. puberulous, segm. shorter than tube, lanceolate, very acute; cor. $\frac{3}{4}$ in., more than twice as long as cal., exserted; capsule over $\frac{1}{2}$ in., slightly clavate, rather longer than the closely inverting cal.; seeds nearly circular.

Sandy flats, covered at high tides, in the dry districts; rare. Mulliativu (Gardner); Jaffna to Mannar, abundant. Fl. Feb.; pale violet.

Also in S. India.

7. RUELLIA, *L.*

Perennial herbs, l. opp., entire, fl. rather large, axillary, solitary or few, bracts 0, bractlets large, leafy; cal. deeply cut, segm. 5, narrow, equal; cor. narrowly tubular at base then campanulate-funnel-shaped, lobes 5, nearly equal, contorted in bud, the upper two slightly connate to form an upper lip; stam. 4, didynamous; capsule clavate, with a solid base, inflated above, not compressed, pointed; seeds about 6 in each cell, imbricate, orbicular, much compressed, thin, margined, densely covered with elastic hygroscopic hair, retinacula long, curved, rigid.—Sp. 150; 9 in *Fl. B. Ind.*

L. sparsely hairy . . . . . 1. R. RINGENS.
L. densely pubescent . . . . . 2. R. PATULA.

1. **R. ringens,** *L. Sp. Pl.* 635 (1753). **Nil-puruk,** *S.*

Herm. Mus. 13. Burm. Thes. 144. Fl. Zeyl. n. 234. Moon Cat. 46. *R. prostrata*, Lam., Thw. Enum. 225. And. in Journ. Linn. Soc. ix. 460. Trim. Syst. Cat. Ceyl. 65. C. P. 1987.

Fl. B. Ind. iv. 411 (*R. prostrata*, var. *dejecta*). Bedd. Ic. Pl. Ind. Or. t. 282 (*R. prostrata*) (not good for Ceylon plant).

Stems long, straggling or climbing among other plants, much branched, cylindrical, thickened and purple at nodes, more or less pubescent; l. usually small, $\frac{3}{4}$–1 in., but occasionally $2\frac{1}{2}$ in., oval or ovate-oval, acute or subacute at both ends, nearly entire, thinly hairy on both sides, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. solitary, axillary, nearly sessile, bractlets precisely like the l. but smaller, petioled; cal. cut $\frac{3}{4}$ to base, segm. filiform, very acute, ciliate; cor.-tube $\frac{5}{8}$ in., lobes oval, obtuse, spreading or

recurved; capsule nearly $\frac{3}{4}$ in., oblong-clavate, lower half solid and stalk-like.

Low country up to 3000 ft.; very common. Fl. all the year; clear pale mauve-violet.

Throughout India and in N. Africa.

Linnæus's name has long priority over Lamarck's; but he quotes for it the plate in Hort. Malab. ix. t. 64, which is very bad, and seems to represent something else—hence his name has been dropped or misapplied by systematists.

[*R. repens*, L., is given as found near Galle, T. Thomson, by Anderson in Journ. Linn. Soc. 460. The specimen is not now in Herb. Kew under that name, and the locality is omitted in Fl. B. Ind.]

2. **R. patula,** *Jacq. Misc. Bot.* ii. 358 (1781).
Thw. Enum. 225. C. P. 2628.
Fl. B. Ind. iv. 412. Wight, Ic. t. 1505 (*Dipteracanthus patulus*).

Stems long, straggling, much branched, cylindrical or subquadrangular, densely pubescent; l. $\frac{1}{2}$–1 in., broadly oval, rounded at base, obtuse or apiculate, closely pubescent on both sides, petiole $\frac{1}{4}$–$\frac{3}{4}$ in.; fl. nearly sessile, solitary or rarely 2 or 3 together, bractlets leafy, oval, densely pubescent; cal. much shorter than bractlets, cut nearly to base, segm. linear-lanceolate, very acute, hairy; cor.-tube $\frac{3}{4}$–1 in.; rest as in *R. ringens.*

Dry region near the coast; rather rare. Trincomalie (Glenie); Puttalam (Ferguson); Jaffna. Fl. Jan.; very pale purplish-blue.

Also in India, Burma, Arabia, Abyssinia.

8. PHAYLOPSIS, *Willd.*

Perennial herb, l. opp., on long petioles, unequal, fl. sessile, in threes in axils of large densely imbricated bracts in a close one-sided strobilate infl., bractlets none; sep. 5, one much larger than the rest and like the bracts ovate and membranous, the rest setaceous; cor. small, 2-lipped, tube exserted, cylindrical, slender, lobes 5, nearly equal, contorted in bud; stam. 4, didynamous, capsule clavate, compressed; seeds 4, compressed with elastic hygroscopic hair.—Sp. 10; 1 in *Fl. B. Ind.*

P. parviflora, *Willd. Sp. Pl.* iii. 342 (1800).
Ætheilema reniforme, Nees, Thw. Enum. 225. C. P. 398.
Fl. B. Ind. iv. 417. Wight, Ic. t. 1533 (*Ætheilema reniforme*).

Stems long, diffuse, slender, often prostrate, much divaricately branched, thickened at nodes and often rooting at lower ones, hairy; l. of each pair very unequal in size, the larger 1–1$\frac{1}{2}$ in., ovate-oval, very unequal-sided at base, acu-

minate, subacute, faintly serrate, sparingly hairy on both sides, petiole ½–1 in.; fl. usually in threes, bracts reniform-orbicular, numerous, ⅜ in., much imbricated, veiny, membranous, viscous-pubescent, strongly ciliate, nearly white, forming a very dense secund terminal spike about 1 in. long, the upper side covered by opp. pairs of much imbricated very unequal bracts; the large sep. ¼ in., ovate, strongly ciliate, veiny; capsule not seen.

Moist region up to 3000 ft.; rather common according to Thwaites. Heneratgoda (abundant) is the only place I have seen it. Fl. May; white.

Also in India and Burma, Madagascar, and Trop. Africa.

9. **DÆDALACANTHUS,** *T. And.*

Herbaceous, l. opp., petiolate, fl. moderate-sized, in lax erect panicles, bracts large, leafy, bractlets very small; sep. linear, connate below; cor.-tube long, very slender, slightly curved, lobes 5, nearly equal, oblong, obtuse, contorted in bud; stam. 2, inserted near mouth of tube, slightly exserted; capsule clavate, with a solid base; seeds 4, circular, compressed, with fine hygroscopic elastic hairs, retinacula large, slightly curved.—Sp. 17; 13 in *Fl. B. Ind.*

D. montanus, *And. in Thw. Enum.* 229 (1860).

Fl. Zeyl. n. 15. *Eranthemum capense*, L. Sp. Pl. 9 (part). *Justicia montana*, Roxb., Moon Cat. 3. Thw. Enum. 229. C. P. 2003.

Fl. B. Ind. iv. 421. Wight, Ic. t. 466.

Stem 2½–3 ft., erect, sub-quadrangular, swollen at nodes, pubescent; l. few, distant, 3–5 in., lanceolate, tapering to both ends, acuminate, faintly crenate, glabrous and shining above, paler and slightly pubescent and with very prominent venation beneath; fl. sessile, very laxly arranged in stiff, stalked, glandular-pubescent, terminal and axillary panicles, bracts leafy, linear, acuminate, bractlets very much shorter; sep. much shorter than bracts but longer than bractlets, pubescent; cor. glandular-pubescent outside, tube 1½ in., laterally compressed, limb about 1 in. diam., lobes truncate; fil. short, glabrous; capsule small, ½ in., glabrous.

Low country up to 2000 ft. in both moist and dry regions; common. Fl. Feb., May, August; pale violet-blue.

Also in S. India.

Linnæus confused Hermann's Ceylon plant with another from the Cape—hence his name.

[*Hemigraphis flava*, Kurz. (*Strobilanthes scaber*), And. in Thw. Enum. 227 (non Nees).—Specimens of this from Ceylon (Walker) are said to be

in Herb. Kew; they were, perhaps, from cultivated plants. The flowers are yellow.]

10. STENOSIPHONIUM, *Nees.*

Straggling undershrub, l. opp. serrate, fl. moderate-sized in very lax interrupted axillary and terminal spikes, bracts and bractlets equal; cal. tubular, about as long as bracts, cut about half way down, segm. equal, often split into separate sep. in fruit; cor. with the lower half of tube extremely narrow and cylindrical, above very much inflated and gibbous, curved, rather contracted at mouth, lobes nearly equal, contorted in bud; stam. 4, didynamous, slightly exserted; capsule oblong, without a solid base; seeds usually 6, 3 (or 4) in each cell, oval, compressed, with very fine hygroscopic elastic hair; retinacula large, curved.—Sp. 5; all in *Fl. B. Ind.*

S. Russellianum, *Nees in Wall. Pl. As. Rar.* iii. 84 (1832). **Bunelu,** *S.* **Nelu,** *T.*

Nees in DC. Prod. xi. 105. Thw. Enum. 226. C. P. 2001.
Fl. B. Ind. iv. 427. Wight, Ic. t. 1503 (not t. 873).

A weedy much-branched undershrub, stem 3–5 ft., slender, thickened at nodes, glabrous; l. 2–4½ in., oval, much tapering to base and decurrent on petiole (the upper ones rounded or subcordate at base) caudate-acuminate, obtuse, coarsely serrate or crenate-serrate, glabrous when mature but usually cottony beneath when young, rather stiff, lat. veins numerous, parallel, prominent beneath, petiole of the lower l. long, of the uppermost ones short or none; bracts and bractlets oblong-ovate, acute, glandular-pubescent; sep. oblong, acute, usually with glandular hair and often with longer bristly ones; cor. nearly ¾ in., glabrous; capsule ⅜ in., slightly exceeding cal.

Var. β, **subsericeum,** *Nees in Wall. l. c.* (sp.).

L. smaller and more numerous, very white beneath with cottony tomentum which is sometimes persistent in old ones.

Forests of the dry region; very common, forming an undergrowth. In the moist region, rare, extending up to 3000 ft.; *e. g.*, Galagama; Dolosbagie. Fl. December–Feb.; pale violet, with darker spot on the lobes.

Plays the part of a species of *Strobilanthes* in the dry-country forests. Var. β is easily taken for *S. stenodon* when not in flower.

11. STROBILANTHES,* *Bl.*

Shrubs or herbs, usually of but a few years' duration, often

* From στρόβιλος, from the densely spicate inflorescence of some species covered with large imbricated bracts, like a hop.

gregarious, stems usually quadrangular when young, l. opp., generally large, toothed or serrate, usually lineolate, fl. sessile or rarely (apparently) stalked, moderate-sized or large, usually in heads or spikes, rarely in panicles of cymes, floral bracts various, often large and much imbricated, bractlets usually small and linear or 0; sep. 5, generally equal, often combined into a cal. when in fl., but distinct and often enlarged in fruit; cor. funnel-shaped or narrowly campanulate, often contracted in lower part into a slender narrow tube, straight or curved, lobes 5, nearly equal, contorted in bud; stam. 4, didynamous, or 2, anth. not appendaged; ov. with 2 ovules in each cell; capsule small; seeds 4 or 2, oval, much compressed, glabrous or hairy, retinacula strong, curved. Sp. 180; 146 in *Fl. B. Ind.*

One of the largest genera in our flora, and of remarkable interest. All the species but three appear to be endemic, but they cannot be said to have been exhaustively compared with those of the S. Indian Hills, and we may probably have other species here yet undetermined from not having been met with in flower. Many of the species which grow in the upper montane zone are remarkable for their gregarious occurrence in vast abundance and over large areas. The principal ones, especially common, and together or separately forming unbroken sheets of undergrowth in the forests, are *S. viscosus*, *asperrimus*, *calycinus*, and *sexennis*, to which may be added less commonly *S. Walkeri*, *anceps*, *Arnottianus*, *vestitus*, *Hookeri*, *laxus*, *pulcherrimus*, and a few others. These live for several years without flowering, growing close together with straight erect stems, which in some reach a height of 8–10 ft., are quite woody, and several inches in diameter. A few flowers may here and there be found every year, but it is not until the plants reach a certain age, apparently usually from 10–13 years, that the whole patch or area bursts into simultaneous blossoming. These patches or districts are often of great extent, and the boundaries between those of different ages are very conspicuous, being as distinct as if artificially sown.* After this general and profuse flowering the whole patch begins to wither and ripen the seed—a process which takes several months or even a year (whence ripe seed is rarely found in herbariums), and then dies down. There is probably a patch to be found flowering somewhere in the mountains every year. The wood is hard but brittle, with a large pith, and makes very good fuel, and the flowers are often beautiful. The name 'Nelu' is applied to the whole genus, and, indeed, is extended to include Acanthaceæ generally.

Stam. 2; fl. in spikes (except in 8); sep. connate
 into cal.; seeds glabrous (*Endopogon*).
 Bractlets 0; cor.-lobes as long as tube . . 3. S. STENODON.

* I am indebted for much information about the Nelus to Mr. T. Farr, of North Cave Estate, Bogawantalawa, who, during a long residence in this high mountain region, has paid much attention to the natural features of the country.

Bractlets present (except sometimes in 4); cor.-lobes much shorter than tube.
  Spikes more or less elongated.
    Bracts lanceolate or oblong, acute (obtuse in 2).
      Infl. glandular-hairy.
        Cal.-segm. linear, more than half as long as tube.
          Spikes interrupted; cor. pubescent outside . . . . . . 1. S. VISCOSUS.
          Spikes continuous; cor. glabrous outside . . . . . . 2. S. NOCKII.
        Cal.-segm. triangular, less than half as long as tube.
          L. broadly oval; spikes short. . 4. S. EXAREOLATUS.
          L. linear-lanceolate; spikes long . 6. S. NIGRESCENS.
      Infl. glabrous (see also var. of 1) . . 5. S. RHYTISPERMUS.
    Bracts oval, obtuse . . . . . . 7. S. RHAMNIFOLIUS.
  Fl. in dense heads with empty bracts outside 8. S. DEFLEXUS.

Stam. 4; fl. in heads (rarely spikes) or panicles; sep. usually distinct.
  Fl. sessile in heads or dense spikes.
    Bracts oblong-lanceolate or oval, outer 2 or more usually empty.
      Seeds hairy at least on the margin.
        Fl. in small heads.
          Cor.-tube under ½ in. . . . . . 10. S. WALKERI.
          Cor.-tube over ½ in.
            Bracts lanceolate, acute, bullate . 11. S. THWAITESII.
            Bracts oblong, obtuse, very silky . 12. S. CAUDATUS.
            Bracts spathulate, obtuse, hispid . 18. S. EXSERTUS.
        Fl. in short spikes.
            Bracts obtuse; peduncles winged . 13. S. ANCEPS.
            Bracts acute; peduncles not winged 19. S. GARDNERIANUS.
      Seeds glabrous; fl. in small heads . . 9. S. LANCEOLATUS.
    Bracts ovate or orbicular.
      Seeds hairy at least on the margins.
        Fl. in small heads.
          L. dotted with red glands . . . 14. S. PUNCTATUS.
          L. without glands . . . . . 15. S. ARNOTTIANUS.
        Fl. in spicate strobiliform heads.
          L. hispid-hairy . . . . . . 16. S. ASPERRIMUS.
          L. glabrous . . . . . . 17. S. TRIFIDUS.
      Seeds glabrous.
        Fl. in heads.
          Bracts ovate, acute.
            Bracts entire . . . . . . 20. S. VESTITUS.
            Bracts serrate . . . . . . 24. S. ZEYLANICUS.
          Bracts orbicular, obtuse.
            Fl. white; stam. much exserted . 21. S. HOOKERI.
            Fl yellow; stam. slightly exserted . 22. S. CALYCINUS.
        Fl. in spikes.
            Cor.-lobes long, very acute; stam. much exserted . . . . . 23. S. LAXUS.
            Cor.-lobes rounded; stam. included 25. S. SEXENNIS.

Fl. on slender ped., in lax panicles, no floral bracts, rarely bractlets (*Leptacanthus*).
Cor. glabrous outside.
L. oval, nearly sessile . . . 26. S. HELICOIDES.
L. lanceolate, petiolate . . . 27. S. PANICULATUS.
Cor. pubescent outside . . . 28. S. PULCHERRIMUS.

1. **S. viscosus,** *And. in Thw. Enum.* 226 (1860).
Justicia viscosa, Moon Cat. 3. *Endopogon viscosus*, Nees in DC. Prod. xi. 104 (excl. var. β). C. P. 2928, 2002 (part).
Fl. B. Ind. iv. 431.

Stems 3-5 ft., glabrous, purple, with many erect branches, l. variable, typically 2–4 in., oval, acute at base, acuminate, acute, serrate, hispid on both sides, often very much smaller and nearly glabrous, or sometimes larger and nearly rotundate, petiole ½–1 in.; fl. rather large, opp., spikes 2–4 in., axillary and terminal, shortly stalked, narrow, interrupted, densely covered with long glandular hairs, bracts about ½ in., narrowly lanceolate, acute, bractlets ¼ in., linear, all very viscous with glandular hairs; cal. glandular-pubescent segm. about as long as tube, linear-lanceolate, acute; cor.-tube 1 in., pubescent outside, lower half very slender, upper half much ventricose, oblique, lobes short, rounded, recurved; stam. 2, slightly exserted, anth. large.

Var. β, **digitalis,** *Clarke. Endopogon digitalis*, Nees, l. c.

L. glabrous; bracts shorter, without glandular hair.

Var. γ, **argutus,** *Clarke. Endopogon argutus*, Nees, l. c.

L. glabrous, more rigid and more acurately toothed.

Montane zone, 3000–7000 ft.; rather common, gregarious. Fl. November–March; white, or very pale pinkish-purple.
Endemic.
A variable species in the character of the inflorescence, which always has a strong musky odour; but the two named varieties are scarcely worth distinction.

2. **S. Nockii,** *Trim.* [PLATE LXX.]

Stems 2–4 ft., stout, rough on the angles, l. large, 3–7 in., broadly oval, acuminate, acute, finely crenate-serrate, densely covered on both sides with erect, stiff, glandular hair, paler beneath and with parallel prominent veins; fl. large, spikes numerous, close not interrupted, the whole forming a compact pyramidal infl., bracts about ½ in., lanceolate-oblong, obtuse, bractlets linear, a little shorter, all closely covered with gland-tipped hairs and very viscous; cal. about as long as bracts, segm. more than half as long as tube, linear, uppermost rather the largest; cor. about 1 in., glabrous outside, the narrow

lower part of tube rather over $\frac{1}{4}$ in., slightly curved, the upper part campanulate-funnel-shaped, hairy within, lobes short, rounded; stam. 2, not exserted, fil. with spreading white hair below; capsule $\frac{3}{4}$ in., narrowly rhomboid-oblong, scarcely compressed, blunt, slightly tapering to base, glabrous; seeds 2, $\frac{1}{4}$ in, glabrous, dark brown.

Upper montane zone at about 6000 ft.; very rare. Sita Eliya, near Hakgala; first noticed by W. Nock, Superintendent of Hakgala Bot. Gardens, in 1893. Fl. March, April; bright violet.

Endemic.

Whole plant very strongly musk-scented. The seeds take just a year to mature.

3. **S. stenodon,** *Clarke in Fl. B. Ind.* iv. 432 (1884).
C. P. 3874, 3876.

Stems 4-5 ft., obscurely quadrangular, glabrous, young shoots cottony; l. 2-4 in., lanceolate-oval, tapering to base, acuminate, obtuse, faintly crenate-dentate, glabrous and copiously lineolate above, densely adpressed-pubescent beneath, with silvery or yellowish silky hair, lat. veins very oblique, petiole 1-1$\frac{1}{2}$ in.; fl. opp., moderate-sized, spikes slender, linear, rather lax, unbranched, axillary and terminal, bracts about $\frac{1}{3}$ in., leafy, obovate-oblong, obtuse or rounded, concave, woolly in upper part, veined, bractlets 0; cal. slender, nearly glabrous, cut fully half way down, segm. rather unequal (2 longer), narrowly linear, very acute, bristle-pointed; cor.-tube about $\frac{1}{2}$ in., glabrous outside, hairy within, lower half very narrow, upper half campanulate-funnel-shaped, laterally compressed, split for some way down the back between the posterior lobes, lobes $\frac{1}{2}$ in., the two upper linear-oblong, subacute, spreading, divaricate, the three lower (forming a lower lip) oblong, obtuse; stam. 2, exserted through the split cor.-tube; style curved, exceeding stam.; capsule $\frac{1}{2}$ in., clavate-ovoid, pointed; seeds 2, oblong-oval, glabrous, striate, yellow.

Intermediate district; very rare. Below Lakkaigalla, Matale East, 1863 (Thwaites); Lagalla, E. Matale, 1865 (Beckett); on the summit of Ritigala, N.C. Prov. (2500 ft.), not in flower, 1887. Fl. November; very pale violet, with darker veins, faintly almond-scented.

Endemic.

Has a strong outward resemblance to *Stenosiphonium Russellianum*, and before the flowering period the leaves are often very white beneath, as in the var. *subsericeum* of that species, to which Thwaites referred C. P. 3876. The specimens from Lagalla are for the most part nearly glabrous, but the Ritigala ones have the young stems and the under surface of the l. very densely silky, with adpressed white or golden hair. Roots brought into the Gardens thence in 1887 did not flower till 1893, and then died off.

The deeply cut narrow lobes of the cor. give this a very different look to the rest of the genus.

4. **S. exareolatus,** *Clarke in Fl. B. Ind.* iv. 432 (1884).
Endopogon consanguineus, Nees, l. c. 104 (part). *Stenosiphonium diandrum*, Nees, l. c. 105. *S. consanguineus*, And. in Thw. Enum. 226. C. P. 2002 (part).
Fl. B. Ind. iv. 432.

Stems quadrangular, glabrous; l. broadly oval, tapering to base, suddenly acuminate, obtuse, shallowly crenate-serrate, glabrous but copiously lineolate above, slightly cottony-hairy on veins beneath, petiole $\frac{3}{4}$–1 in.; fl. in slender, rather lax, glandular-pubescent spikes under $1\frac{1}{2}$ in. long, bracts finely pubescent, bractlets narrower (sometimes absent); cal. tubular, longer than bracts, finely pubescent, segm. $\frac{1}{3}$ as long as tube, narrowly triangular; cor.-tube $\frac{3}{4}$ in., pubescent outside, lower half very slender, upper half campanulate, ventricose, lobes equal, oval, obtuse; stam. 2; capsule not seen.

Montane lower zone; rare. Maturata District at 3000 ft. Fl. Feb.; pale purple-blue.
Endemic.
I have seen only the C. P. specimens in Herb. Perad. named *S. consanguineus*, And., by Thwaites.

5. **S. rhytispermus,** *Clarke in Fl. B. Ind.* iv. 432 (1884).
S. hypoleucus, And. in Thw. Enum. 226. C. P. 2897.
Fl. B. Ind. iv. 433.

Stems sub-quadrangular, glabrous below with some deciduous cotton above; l. $3\frac{1}{2}$–$4\frac{1}{2}$ in., oval-lanceolate, tapering to base, acuminate, subacute, serrate-dentate, glabrous and lineolate above, grey with cottony hair beneath, lat. veins prominent, very oblique; spikes slender, lax, glabrous, terminal and axillary (often 2 from an axil), bracts lanceolate, acuminate, glabrous; cal. about length of bracts, glabrous, cut about half way down, segm. acuminate; stam. 2; capsule narrowly oblong oval; seeds 2, oblong, glabrous, furrowed.

Montane zone (?), very rare. I have only seen the C. P. specimens which were collected by Gardner in the 'Central Province,' but are not localised more precisely, and are somewhat imperfect.
Endemic.

6. **S. nigrescens,** *And. in Thw. Enum.* 226 (1860).
C. P. 3353.
Fl. B. Ind. iv. 433. Bedd. Ic. Pl. Ind. Or. t. 217.

Stems 4–5 ft., stout, purple at the nodes or throughout; l. lanceolate or linear-lanceolate, tapering to base, caudate-acuminate, obtuse, serrate, quite glabrous, lineolate, petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; spikes 4–6 in., continuous, densely covered with long white glandular hair, bracts $\frac{3}{8}$–$\frac{1}{2}$ in., linear-lanceolate, acute, bractlets shorter, linear; cal. rather longer than bractlets, with copious long glandular hairs, much enlarged in fruit,

segm. less than half length of tube, acute; cor.-tube over $\frac{3}{4}$ in., lower half narrow-tubular, upper half inflated gibbous, lobes short, oval, sometimes slightly emarginate; stam. 2, scarcely exserted; capsule nearly $\frac{3}{4}$ in., ovoid-oblong, blunt; seeds 4, oval, $\frac{1}{4}$ in., smooth and shining.

Lower montane zone; very rare. Ambagamuwa Dist. above 3000 ft. Fl. Dec.; pale purple.

Endemic.

The flowers are very like those of *S. viscosus*, but darker.

7. **S. rhamnifolius,** *And. in Thw. Enum.* 226 (1860).

Buteræa rhamnifolia, Nees, l. c. 725. *Endopogon rhamnifolius*, Wight, Ic. iv. pt. 4, 3. C. P. 2007.

Fl. B. Ind. iv. 433. Wight, Ic. t. 1521.

Stems stout, sub-quadrangular, glabrous, purplish, l. $2\frac{1}{2}$–$3\frac{1}{2}$ in., oval, tapering and somewhat decurrent on petiole, caudate-acuminate, obtuse, bluntly serrate, glabrous on both sides, lat. veins conspicuous, very oblique, petiole $\frac{1}{2}$–1 in., glabrous; fl. sessile, spikes numerous, panicled, dense, 2–3 in., shortly stalked, densely clothed with long white spreading glandular hair, bracts rather large, overlapping, oval, obtuse, bractlets linear, shorter than bracts, all densely glandular-hairy; cal. narrow, segm. linear, about half as long as tube, very glandular-hairy; cor.-tube $\frac{3}{4}$–1 in., lower half very slender, upper half inflated, gibbous, hairy within; stam. 2, scarcely exserted; capsule not seen.

Lower montane zone; rare. Hantane at 4000 ft. Fl. Nov.; very pale purple.

Endemic.

8. **S. deflexus,** *And. in Thw. Enum.* 227 (1860).

C. P. 1998.

Fl. B. Ind. iv. 433. Bedd. Ic. Pl. Ind. Or. t. 218.

Stems 3–5 ft., slender, much branched, swollen above the nodes, glabrous; l. usually rather small, $1\frac{1}{2}$–$3\frac{1}{2}$ (sometimes larger), lanceolate or linear-lanceolate, attenuate at base and decurrent on petiole, caudate-acuminate, obtuse, glabrous, copiously lineolate, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. 2 or 3 together in small heads which are about $\frac{3}{4}$ in., narrow, solitary or in twos, axillary, peduncles about 1 in., thickened upwards, usually strongly deflexed, outer bracts empty 3–5, enclosing whole head, nearly $\frac{3}{4}$ in., oblong, subacute, glabrous, stiff, floral bracts narrowly lanceolate, acute, bractlets filiform; cal. narrowly tubular, glabrous, segm. not half as long as tube, linear-lanceolate, very acute, cor.-tube nearly 1 in., much bent in the middle, lower half very narrow, upper half inflated, gibbous, lobes equal, rotundate, spreading; stam. 2; capsule

½ in., narrowly oblong; seeds 4, oval, with a thicker border, smooth and shining, grey.

Moist region up to 4000 ft.; rather rare. Avisawella (Ferguson); Hewaheta; Hantane. Fl. Nov.–Jan.; very pale purple.

Endemic.

9. **S. lanceolatus,** *Hook. ex Nees in DC. Prod.* xi. 181 (1847).

Goldfussia Myrtinia, Nees, l. c. 174. *S. adenophorus*, Nees, l. c. 182. Thw. Enum. 228. And. in Journ. Linn. Soc. ix. 466 (non Bedd.). C. P. 162.

Fl. B. Ind. iv. 437.

Stems 1½–3 ft., erect, sharply quadrangular, the angles often narrowly winged, glabrous, branches erect; l. numerous, 2–3 in., lanceolate, tapering to base and decurrent on petiole, caudate-acuminate, acute, very slightly serrate and spinous-denticulate on narrowly reflexed margin, glabrous, petiole obscure; fl. 1–3, in small, solitary (or 2), shortly peduncled, axillary heads with 2 outer opposite leaflike empty bracts, which are ¾ in., oval, glabrous, floral bracts under ½ in., oblong, bractlets ¼ in., linear; cal. ½ in., segm. about a third the length of tube, narrowly lanceolate, mucronate, pubescent; cor.-tube fully 1 in., lower half very narrow, upper campanulate, glabrous outside, lobes short, oval, obtuse or subacute; stam. 4, fil. hairy; capsule not seen; 'seeds 4, glabrous.'

Moist low country up to 3000 ft.; rather common. Sabaragamuwa; Four Korales; Kukul Korale; Labugama, abundant. Fl. Dec., Jan.; pale purple.

Endemic.

The Fl. B. Ind. erroneously quotes for this *Martynia lanceolata*, Moon, which is given correctly in the same volume for *Chirita Moonii*. The present plant was, however, called *Myrtinia lanceolata* by Macrae in MS. as quoted by Nees, l. c. 174.

10. **S. Walkeri,** *Arn. ex Nees in DC. Prod.* xi. 181 (1847).

Thw. Enum. 227. C. P. 3517 (2009 [part]).

Fl. B. Ind. iv. 440. Bedd. Ic. Pl. Ind. Or. t. 222.

Stems 2–4 ft., bluntly quadrangular, glabrous; l. 3–7 in., oval or lanceolate-oval, tapering to base, shortly acuminate, obtuse, serrate-dentate, harsh with small pustular prickly hair on both sides, lineolate, paler beneath, petiole ½–1 in.; fl. 1–4 together, heads about ¾ in., on short, stout, quadrangular or slightly winged peduncles thickened upwards, solitary or 2 or 3 in an axil or all raised on a short very thick common peduncle, outer bracts 2, short, floral bracts large, about ½ in., broadly oval, subacute, with undulate margins, glabrous, with strong pinnate purple veins, much bullate between the veins, bractlets small, linear; cal. over ⅜ in., longer than bractlets, segm. cut almost to base, oblong-

lanceolate, subacute, ciliate; cor.-tube about $\frac{3}{8}$ in., funnel-shaped, hairy at mouth within, lobes large, broadly oblong, obtuse, reflexed, more or less crisped on margin; stam. 4, exserted; capsule large, $\frac{7}{8}$ in., oblong, obtuse, glabrous; seeds 2, nearly $\frac{1}{2}$ in., very thin, covered with long adpressed silky hair.

Var. β, **stenocarpa,** *Clarke, l. c.* 441.

L. broader, pubescent beneath; capsule small, $\frac{3}{8}$ in., seeds $\frac{1}{4}$ in.

Montane zone, 4000–7000 ft.; rather common, gregarious. Hantane; Maturata; Adam's Peak; Hakgala. Var. β, in the low dry country; very rare. Bintenne. Fl. Sept.–February; white, tinged or veined with pink.

Endemic.

The plants from Hakgala are covered with a short, dense, glandular pubescence. Var. β is probably a distinct species, but I have not seen flowers.

11. **S. Thwaitesii,** *And. in Thw. Enum.* 227 (1860).
C. P. 3516 (2009 part).
Fl. B. Ind. iv. 441. Bedd. Ic. Pl. Ind. Or. t. 219.

Stems quadrangular, somewhat hispid; l. large 5–9 in., oval-lanceolate, much tapering into petiole, caudate-acuminate, acute, dentate, scabrous with small prickly hairs on both sides and often slightly pubescent beneath, petiole about 1 in.; fl. 1–3, heads $\frac{3}{4}$–1 in., on short quadrangular more or less pubescent peduncles 1–3 in an axil, or all on a common peduncle, outer bracts 2, opp., floral bracts $\frac{3}{4}$ in., lanceolate, acuminate, acute, ciliate, pinnately veined, much bullate between the veins, bractlets shorter, linear, ciliate; cal. under $\frac{1}{2}$ in., segm. almost distinct, linear, long-ciliate; cor. about 1 in., glabrous outside, pilose within, stam. 4, included; capsule not seen.

Montane zone (?), very rare. Ambagamuwa Dist., 1855 (Thwaites). Fl. white.

Endemic.

I have seen only the C. P. specimens.

12. **S. caudatus,** *And. in Thw. Enum.* 228 (1860).
C. P. 364.
Fl. B. Ind. iv. 441. Bedd. Ic. Pl. Ind. Or. t. 213.

Stems 4–5 ft., nearly cylindrical, slender, finely pubescent, purplish; l. 3–5 in., lanceolate, acute at base, very narrowly caudate, entire or very nearly so, glabrous above, pubescent on veins beneath, ciliate; fl. 3–6, heads small, about $\frac{3}{4}$ in., on slender hairy deflexed peduncles, solitary or 3 on a common peduncle 1–1$\frac{1}{2}$ in. long, bracts small, under $\frac{1}{2}$ in., oblong,

obtuse, silky with long yellowish hair, bractlets shorter, oblong-linear; cal. $\frac{3}{8}$ in., segm. almost distinct sep., linear subacute, covered with long silky hair; cor.-tube $\frac{3}{4}$–1 in., with a very short narrow base, then narrowly campanulate, glabrous without, with 2 lines of hair within; stam. 4, included; capsule $\frac{5}{8}$ in., obovate-ovoid, pointed, pubescent; seeds 2, $\frac{1}{4}$ in., shaggy with long hair.

Var. β, **laniceps,** *Clarke, l. c.*

Hairs on peduncles, bracts and cal. more copious, dense and long.

Moist region, 2000–3000 ft.; very rare. Only found at Watagoda, Hantane in 1855 (Thwaites). Fl. Dec.; pale sulphur-yellow, with two pink bands along the upper side of the tube.

Also in Southern India.

Var. β is scarcely worth note; it grew with the type.

13. **S. anceps,** *Nees in DC. Prod.* xi. 189 (1847).
Thw. Enum. 229. C. P. 2000.
Fl. B. Ind. iv. 442 (excl. var. *punctata*). Bedd. Ic. Pl. Ind. Or. t. 204.

Stems 2–3 ft., swollen above nodes, sub-quadrangular below, sharply so and often slightly winged above, pubescent with crisp deflexed hairs, much branched divaricately; l. variable, $1\frac{1}{4}$–4 in., rounded or tapering at base, acuminate, subacute, entire or very slightly crenate-dentate, glabrous or shortly hairy above, hairy on veins beneath, strongly ciliate, petiole $\frac{3}{4}$–1 in., hairy; fl. 4–8, spikes 1–$1\frac{1}{2}$ in., not very crowded, peduncles 1–3 in., terminal and lateral, usually with a pair of sessile leafy ovate bracts half way up and another pair at summit, the bases of which are decurrent, forming wings on peduncle, floral bracts broadly oval or spathulate-oval, leaf-like, obtuse or subacute, recurved, slightly pubescent, strongly ciliate, often densely covered with minute yellow glands, bractlets filiform; sep. $\frac{1}{4}$ in., rather longer than bractlets, linear, hairy; cor.-tube $\frac{3}{4}$ in., narrowly campanulate, straight, very glandular-pubescent outside, stam. included; capsule not seen, $\frac{1}{3}$ in., oblong; seeds 4, $\frac{1}{10}$ in., closely covered with hygroscopic elastic hairs.'

Moist zone up to 7000 ft.; common, gregarious; very rare in the low country, *e.g.*, Eknaligoda, near Ratnapura; Singhe Raja Forest; Ambagamuwa. Fl. August–April; white.

Also in Southern India.

An insignificant-looking species. Has a faint aromatic scent.

14. **S. punctatus,** *Nees in DC. Prod.* xi. 182 (1847).
S. anceps, var., Thw. Enum. 229. C. P. 3998.
Fl. B. Ind. iv. 442 (*S. anceps*, var.).

Stems slender, quadrangular, with many erect branches,

densely pubescent; l. very small, $\frac{1}{4}$–$\frac{3}{4}$ in., ovate or rotundate, on very short hairy petioles, obtuse or cordate at base, obtuse or rounded at apex, margin recurved, entire, with a few bristles on margin, otherwise glabrous, copiously dotted beneath with dark red sessile resinous glands; fl. 3 or 4, heads very small, peduncles $\frac{3}{4}$–1 in., terminal and axillary, with a pair of small leafy rounded bracts half way up, floral bracts spathulate-rotundate, strongly ciliate at base, gland-dotted, bractlets linear, ciliate; sep. linear, with long white cilia; cor. very pubescent outside, tube $\frac{3}{4}$ in., funnel-shaped; stam. 4, included; capsule not seen.

Montane zone; very rare. Adam's Peak, 1869 (Thwaites). Fl. Feb. and March; white.

Endemic.

A very distinct species, of which only a poor specimen of Walker's was available to Nees, Anderson, and Clarke, and hence placed by them under *S. anceps*.

15. **S. Arnottianus,** *Nees in DC. Prod.* xi. 179 (1847).
Thw. Enum. 228. C. P. 2005.
Fl. B. Ind. iv. 442. Bedd. Ic. Pl. Ind. Or. t. 261.

Stems 2–4 ft., sub-quadrangular, hispid pubescent especially above; l. 2–3$\frac{1}{2}$ in., ovate, cordate at base, acuminate, acute, dentate-serrate, hispid above, hairy beneath; fl. rather small, 2–5, heads small, rounded, solitary or 2 or 3 terminating short axillary branches, peduncle about $\frac{1}{2}$ in., deflexed, with white spreading hair, bracts broadly oval, obtuse, leafy, silky-hairy beneath, bractlets linear; sep. linear, rather longer than bractlets, with long silky hair; cor. pubescent outside, tube $\frac{1}{2}$ in., funnel-shaped-campanulate, straight, lobes ovate, subacute, quite equal; stam. slightly exserted; capsule not seen; 'seeds hairy.'

Upper montane zone; rare. Abundant about Nuwara Eliya. Fl. white.
Endemic.

16. **S. asperrimus,** *Nees in DC. Prod.* xi. 183 (1847).
S. trifidus, Nees, Thw. Enum. 228 (part). *S. lupulinus*, And. in Journ. Linn. Soc. ix. 468 (part). C. P. 254 (part).
Fl. B. Ind. iv. 443.

Stems shrubby below, very stout, bluntly quadrangular, tumid above nodes, slightly hispid; l. large, 5–9 in., oval, much tapering at base and decurrent on petiole, acuminate, subacute, dentate-serrate, more or less hispid-hairy or minutely prickly on both sides, sometimes bullate between the fine reticulate veins, petiole about $\frac{1}{2}$ in., obscure; fl. numerous, heads at first globose but extending into oblong-ovoid spikes 1$\frac{1}{2}$–2$\frac{1}{2}$ in. long, usually in threes, on reflexed

stalks, but often 5–9, peduncles stiff, slightly hairy, axillary with leafy bracts at the branches, floral bracts large, about $\frac{1}{2}$ in. (the lowest ones often smaller, loose, empty), broadly oval or rotundate, acute or apiculate, much imbricated, concave, usually glabrous, pinnately veined, lineolate, bractlets like the bracts but thinner and obtuse (none according to Fl. B. Ind.); cal. very small, under $\frac{1}{4}$ in., segm. very deep, oblong, obtuse; cor.-tube $\frac{5}{8}$ in., very narrow at base, campanulate-funnel-shaped, lobes rounded; capsule $\frac{3}{8}$ in., oblong-ovoid pointed; seeds 'hairy on margin.'

Moist region up to 6000 ft.; rather common, gregarious. Hiniduma; Singhe Raja Forest; Ambagamuwa; Ramboda; Nuwara Eliya; Lagalla. Fl. Dec.–April; pale purple, the bracts white tinged with green or pink.

Endemic.

An abundant species in some of the hill-forests. It is to this that the name *Strobilanthes* is particularly appropriate, the heads being very hop-like in appearance. Exceedingly variable in foliage and inflorescence. Requires careful comparison with the S. Indian species, with one of which it is probably con-specific.

17. **S. trifidus,** *Nees in DC. Prod.* xi. 185 (1847).
Thw. Enum. 228 (part). *S. lupulinus*, And. in Journ. Linn. Soc. ix. 469 (part). C. P. 254 (part).
Fl. B. Ind. iv. 443.

Smaller and more slender than *S. lupulinus*, l. smaller, thinner, usually glabrous or nearly so; heads smaller, solitary or in threes, fl. similar; capsule $\frac{1}{4}$ in., obovate-ovoid, pointed, seeds 4, with a ring of dense elastic hygrometric hair on margin, retinacula large, straight.

Moist low country below 2000 ft.; rather common. Hiniduma; Karawita Kande; Sitawaka; Avisawella; Hewesse. Fl. Sept.–Nov.; pink or purple, the bracts green tinged with purple.

Endemic.

I do not find myself able to decide as to many specimens whether they should be referred to this or the last, and believe the species should be combined as indistinguishable (as was done by Anderson). Some specimens from Hiniduma have the bracts covered with long glandular hair (*S. lupulinus*, Nees (?).

18. **S. exsertus,** *Clarke in Fl. B. Ind.* iv. 445 (1184).
Stenosiphonium zeylanicum, And. in Thw. Enum. 225. C. P. 3577.
Fl. B. Ind. iv. 445.

Stems 12–18 in., prostrate and rooting at lower nodes, cylindrical, pubescent or hispid; l. $1\frac{1}{4}$–$2\frac{1}{2}$ in., oval, attenuate at base and decurrent on petiole, shortly acuminate, subacute, dentate-serrate, scabrous with prickly hairs on both sides, copiously lineolate, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., obscure; fl. 4 or 5, heads small, under $\frac{1}{2}$ in., very dense, flat on top, solitary, on coarsely hairy leafy axillary peduncles (or branchlets), outer bracts 2, leafy, floral bracts $\frac{1}{2}$ in., spathulate-oval, obtuse, hispid-hairy,

somewhat recurved, bractlets linear, ciliate; cal.-segm. very deep, $\frac{1}{3}$ in., rather longer than bractlets, narrowly linear, hairy; cor. glabrous outside, tube over $\frac{1}{2}$ in., lower half slender, narrow, upper half widely funnel-shaped, lobes oblong-oval, obtuse; stam. 4, slightly exserted; capsule $\frac{1}{3}$ in., oblong, pointed; seeds 4, with a dense fringe of hair round margin, elastic when wetted.

Var. β, **integra**, *Clarke*, *l. c.* C. P. 3661.

L. nearly entire, glabrous.

Dry region; rather rare. Batticaloa Dist.; Badulla Dist.; Bintenne; Dambulla. Var. β, 'Central Prov.' Fl. March; very pale violet.

Endemic.

The material for var. β is very scanty, only leaves; it is doubtful whether they belong to this species. The only dry-country *Strobilanthes* (except *stenodon*).

19. **S. Gardnerianus,** *And. in Thw. Enum.* 226 (1860).
Endopogon Gardnerianus, Nees in DC. Prod. xi. 723. C. P. 2006.
Fl. B. Ind. iv. 446. Bedd. Ic. Pl. Ind. Or. t. 259.

Stems 1–2 ft., shrubby and bare of leaves below; l. small, $\frac{3}{4}$–$1\frac{1}{2}$ in., nearly sessile, broadly ovate, subcordate at base, obtuse, crenate-serrate, reflexed at margin, hispid-hairy on both sides, often bullate, venation conspicuous; fl. large, 3 or 4 together in axils of large, leafy, recurved, rotundate, glandular-hairy bracts forming dense terminal spikes interrupted below, floral bracts lanceolate-oblong, acute, glandular-hairy at top, bractlets linear, glandular-hairy; cal. $\frac{1}{2}$ in., narrow, segm. deep, linear, glandular-hairy; cor. glabrous outside, tube nearly 1 in., very much curved, lower half narrowly tubular, upper half much inflated, gibbous, lobes oblong-oval, rounded, recurved; stam. 4, slightly exserted; capsule not seen.

Montane zone; very rare. Hantane at 4000 ft.; not found recently. Fl. Jan.; bright pale violet, tube greenish-white beneath.

Endemic.

I have not seen this pretty species in a living state.

[*S. scaber*, Nees, appears in Thw. Enum. 227 as a Ceylon species on the authority of a specimen from 'Walker in Herb. Hook.' (which cannot now be found at Kew). The Fl. B. Ind. says it is reported as cultivated here; I have never seen it. But see under *Hemigraphis flava*.]

20. **S. vestitus,** *Nees in DC. Prod.* xi. 180 (1847).
Thw. Enum. 228. C. P. 3660.
Fl. B. Ind. iv. 449. Bedd. Ic. Pl. Ind. Or. t. 260 (not good).

Stems 2–5 ft., very stout, quadrangular, swollen above nodes, shaggy with deflexed hair; l. $3\frac{1}{2}$–6 in., oval, acute at base, shortly acuminate, subacute, finely serrate-dentate, scabrous with prickly hair above, hispid-hairy beneath, petiole

$\frac{3}{4}$–1$\frac{1}{2}$ in., hispid; fl. large, heads 1–1$\frac{1}{2}$ in., ovoid, on stout drooping or deflexed, shaggy, axillary peduncles $\frac{1}{4}$–1 in. long, bracts much imbricate, large, ovate, acuminate, very acute, somewhat conduplicate, falcately curved outwards, sparingly hairy on surface but strongly ciliate with long white hair, bractlets very small, linear, hairy; sep. unequal, linear-oblong, acute, shaggy with long hair, considerably enlarged in fruit; cor. glabrous, tube $\frac{3}{4}$–1 in., straight, narrow and shortly cylindrical at very base, rest widely campanulate, lobes rather deep; stam. 4, much exserted; capsule $\frac{5}{8}$ in., oblong, pointed; seeds glabrous, retinacula very large, not curved.

Forests of montane zone, 4000–7000 ft.; rather common, gregarious. Maturata; Kellebokka; Dimbula, abundant; Horton Plains. Fl. Oct., November; quite white.

Endemic.

21. **S. Hookeri,** *Nees in DC. Prod.* xi. 185 (1847).
Thw. Enum. 227. C. P. 1999.
Fl. B. Ind. iv. 449. Bedd. Ic. Pl. Ind. Or. t. 262.

Stems 2–4 ft., stout, swollen above nodes, very bluntly quadrangular, slightly hispid; l. 2$\frac{1}{2}$–5 in., oval, acute at base, shortly acuminate, subacute, serrate-dentate, scabrous with prickly hair above and less so beneath, petiole $\frac{1}{2}$–1 in., hispid; fl. very large, heads 1$\frac{1}{2}$–2 in., dense, globose or broadly ovoid, on short thick drooping axillary peduncles or short branches usually bearing a pair of l. (or bracts) a little below the head, bracts very large, about 1 in., much overlapping, rotundate, obtuse or subacute, entire or serrate, glabrous but usually ciliate, thin, bractlets small, spathulate-linear, glabrous; sep. $\frac{1}{2}$ in., longer than bractlets, lanceolate, acute, ciliate, veined; cor.-tube short, campanulate, limb 2 in. diam., lobes broad, rounded, crisped; stam. exserted; capsule not seen; 'seeds glabrous.'

Upper montane zone, 5000–7000 ft.; rather rare, gregarious. Above Ramboda; Hakgala; Horton Plains, abundant; Ambawella. Fl. Sept.–Feb.; pure white, with the tube yellowish and with a few narrow purple veins, bracts pale green.

Endemic.

Flowers much the largest in the genus, deeply cut, and with much exserted stam. Inflor. has a faint pungent odour.

22. **S. calycinus,** *Nees in DC. Prod.* xi. 186 (1847).
S. coloratus, Nees, l. c. (non And.). Thw. Enum. 227. C. P. 309.
Fl. B. Ind. iv. 450. Bedd. Ic. Pl. Ind. Or. t. 209.

Stems 4–5 ft., stout, nearly cylindrical, tumid above nodes, glabrous or slightly hairy in upper part; l. 3–7 in., oval, much tapering at base, acuminate, subacute, shallowly dentate-serrate, rather roughly hairy on both sides, petiole varying

from obscure or very short to $1\frac{1}{2}$ in.; fl. rather large, heads $1\frac{1}{2}$–$2\frac{1}{2}$ in., broadly ovoid, cone-like, drooping but becoming erect in fruit, solitary on short axillary peduncle-like branches often with a pair of l. below bend, bracts large, nearly 1 in., orbicular, much imbricated, entire (or the lowest ones slightly denticulate), glabrous (the lowest ones ciliate), veiny, bractlets $\frac{5}{8}$ in., oblong-lanceolate or spathulate, acute; sep. as long as bractlets, lanceolate, acute; cor. glabrous, tube over $\frac{1}{2}$ in., narrow base short, rest campanulate, lobes broader than long, emarginate; stam. slightly exserted; capsule $\frac{1}{2}$ in., oblong, pointed; seeds 4, glabrous.

Forests of upper montane zone above 6000 ft.; common, gregarious. Nuwara Eliya; Hakgala; Horton Plains, abundant. Fl. Aug.–February; lemon-yellow, straw-coloured, or pale green, bracts white or greenish-white.

Endemic.

Dries black. Inflorescence very hop-like.

23. **S. laxus,** *And. in Thw. Enum.* 228 (1860).
C. P. 2010.
Fl. B. Ind. iv. 450. Bedd. Ic. Pl. Ind. Or. t. 223 (not good).

Stems 4–6 ft. or more, very stout, swollen above nodes, cylindrical, glabrous and shining, purple, l. 4–6 in., ovate, cordate at base, acuminate, acute, shallowly serrate-dentate, glabrous but lineolate above, pubescent on veins beneath, petiole $1\frac{1}{2}$–$2\frac{1}{2}$ in., slender, glabrous; fl. moderate-sized, numerous, spikes 2–6 in., dense, on usually very short axillary peduncles, either solitary or in large panicled clusters from the axils of fallen l. on lower part of stem, bracts over $\frac{1}{2}$ in., imbricate, rotundate-oval, acute, entire, pubescent, pinnately veined, bractlets linear-lanceolate, ciliate; sep. nearly $\frac{1}{2}$ in., as long as bractlets, lanceolate, acuminate, ciliate; cor. nearly glabrous, tube $\frac{1}{2}$ in., campanulate-funnel-shaped, lobes $\frac{3}{8}$ in., narrowly triangular, very acute, reflexed, veined; stam. much exserted; capsule under $\frac{1}{2}$ in., oblong-ovoid; seeds 4, glabrous.

Montane zone, 4000–6000 ft.; rather rare, gregarious. Nuwara Eliya (Gardner); Hantane; Hewahette. Fl. December–Feb.; dull orange-yellow, fil. black.

Endemic.

A very distinct species.

24. **S. zeylanicus,** *And. in Thw. Enum.* 227 (1860).
S. callosus, Nees, l. c. 185 (part). C. P. 3552.
Fl. B. Ind. iv. 451. Bedd. Ic. Pl. Ind. Or. t. 224.

Stems 3–5 ft., quadrangular, glabrous; l. large 4–10 in., oval, tapering to base, acuminate, acute, finely crenate-denticulate, margin slightly recurved, finely scabrous on both sides, densely lineolate, petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; fl. few, rather large, heads $\frac{1}{2}$–2 in. long, ovoid or oblong-ovoid, dense, very com-

pact, sessile or stalked, axillary and terminal, bracts variable, the lower ones often passing into l., all closely overlapping, ovate, acute, irregularly serrate, finely pubescent, often spreading or reflexed with long serrate leafy ends, bractlets linear, acute, puberulous; cal. segm. short, linear-lanceolate, acute; cor. pubescent outside, tube 1¼ in., exserted, lower ½ in. narrow, tubular, rest inflated, narrowly campanulate; lobes short, rounded, crisped; stam. included; capsule not seen.

Moist low country up to 2000 ft.; very rare. Kukul Korale; Ambagamuwa. Fl. Nov.–April; white tinged with pink.

Endemic.

This has not been recently collected.

25. **S. sexennis,** *Nees in DC. Prod.* xi. 187 (1847).

S. cerinthoides, Nees, l. c. 724. Thw. Enum. 229. *Mackenziea* sessilis*, Nees, l. c. 308. C. P. 66, 2593 (2594).

Fl. B. Ind. iv. 474.

Stems 4–10 ft., bluntly quadrangular (cylindrical when old), much branched, glabrous, often with transverse raised ridges, swollen above nodes; l. sessile, 3–6 in., oblong or lanceolate, attenuate below but dilated and stem-clasping at base, shortly acuminate, acute, finely serrate-dentate, glabrous, lineolate; fl. rather large, either distant in long axillary and terminal spikes or closely placed in short ones, rachis glandular-hairy or glabrous, bracts about ⅜ in., rotundate-oval, acute, concave or cupped, glabrous or densely glandular-hairy, bractlets rather longer than bracts, oblong, obtuse, glabrous or glandular-hairy; sep. oblong-linear, obtuse, glabrous or glandular-hairy; cor. glabrous outside, tube ¾ in. or more, curved upwards, narrow portion short, rest narrowly campanulate, lobes large, rounded, emarginate; stam. included; capsule ½ in., ovoid, sharp-pointed; seeds 2, very rugose.

Var. β, **argutus,** *Clarke in Fl. B. Ind., l. c.* *S. argutus*, Nees, l. c. 188.

L. on petioles 1–2 in. long, more deeply dentate, glabrous, thick; spikes rather dense, paniculate, usually very glandular-pubescent.

Var. γ, **hirsutissimus,** *And. in Thw. l. c.* *S. hirsutissimus*, Nees, l. c. 187. C. P. 3626.

L. on petioles 1–2 in. long, broadly oval, often cordate at base, very coarsely serrate, hispid-hairy on both sides, thinner; spikes lax, slender, with distant fl.

---

* Named after Sir J. A. Stewart Mackenzie, Governor of Ceylon, 1837–40, who was the collector or contributor of many Ceylon plants now in the Kew Herbarium.

Forests of the montane zone; common, especially at 6000–7000 ft., gregarious. Var. β, Dimbula; Maturata; Hakgala. Fl. Aug.–April, especially October and November; bright bluish-purple.

Also in the Nilgiri Mts.

The largest and one of the commonest of the Nelus of the hill-forests, attaining the dimensions of a small tree before flowering, the stems often 4 or 5 in. diam., and very handsome when in blossom (the flowers are said to be white in the Nilgiris). Very variable. *S. argutus*, Nees, and *S. cerinthoides*, Nees, are distinguished as varieties in Fl. B. Ind., but their characters are not constant. Has a strong, disagreeable resinous scent.

The name *sexennis* is based on an observation of Walker's, that the plant flowers in its sixth year; but Mr. T. Farr tells me that the great flowering of this, as of several other species, occurs not sooner than the eleventh or twelfth year.

I gathered (first in 1882) at the foot of Totapella, about 7000 ft., a *Strobilanthes* in leaf only, which may be another variety, or perhaps is *S. auriculatus*, Nees (Bedd. Ic. Pl. t. 210); or this may probably be the plant alluded to in Fl. B. Ind. (under *S. sexennis*) as known to Colonel Beddome in Ceylon, but 'of which the flower has not yet been observed.' The leaves are very large, sessile, but with a long tapering base, and densely softly hairy on both sides.

26. **S. helicoides,** *And. in Thw. Enum.* 229 (1860).
Leptacanthus helicoides, Nees, l. c. 170. C. P. 1980.
Fl. B. Ind. iv. 475. Bedd. Ic. t. 220.

Stems 3–5 ft., slender, quadrangular, glabrous; l. $2\frac{1}{2}$–$4\frac{1}{2}$ in., nearly sessile, oval or lanceolate, tapering to base, acuminate, acute, distantly denticulate-serrate, glabrous, thin, pale beneath; fl. rather small, very numerous, on very slender glabrous divaricate ped., in very lax helicoid cymes combined to form very large lax spreading axillary and terminal panicles, bracts in pairs at each bifurcation, leaflike, gradually diminishing in size upwards, floral bracts none, bractlets linear, shorter than sep., glabrous; sep. nearly equal, about $\frac{1}{4}$ in., linear, obtuse, glabrous; cor. glabrous outside, tube $\frac{1}{2}$–$\frac{3}{4}$ in., nearly straight, ventricose, narrow base extremely short, segm. short, rounded; stam. included; capsule $\frac{3}{8}$ in., pointed; seeds 2, silky with adpressed hair.

Montane zone from 3000–6000 ft.; rather common. Ambagamuwa; Hantane; Hewaheta; Nuwara Eliya; near Hakgala. Fl. Nov.–March, August; violet with a white tube.

Endemic.

A pretty delicate plant. The leaves are often a rich reddish-purple beneath.

27. **S. paniculatus,** *And. in Journ. Linn. Soc.* ix. 483 (1867).
S. rubicundus, in Thw. Enum. 229 (? And.). C. P. 3351.
Fl. B. Ind. iv. 475.

Stems 4–5 ft., slender, cylindrical, glabrous; l. 4–8 in., lanceolate or linear-lanceolate, tapering to base, caudate-

acuminate, acute, undulate-crenate, glabrous on both sides, lineolate, thin, pale beneath, petiole $\frac{1}{4}$–$\frac{3}{4}$ in., obscure; fl. rather large, numerous, on short drooping ped. or nearly sessile in very lax helicoid cymes combined to form a large, very lax, glandular-pubescent, erect, pyramidal, terminal panicle, bracts in pairs at every branch, small, linear, nearly glabrous, floral bracts and bractlets none; cal. small, $\frac{1}{6}$ in., glandular-hairy, segm. deep, oblong-linear; cor. glabrous outside, tube nearly 1 in., tubular-funnel-shaped, lobes shallow, erect; stam. included; capsule not seen.

Moist region, 2000-4000 ft.; rare. Maskeliya; Ambagamuwa; Sabaragamuwa. Fl. Nov.–Dec.; rose-violet.

Endemic.

Very near the true *S. rubicundus* of S. India, figured (as *S. paniculatus*) in Bedd. Ic. Pl. Ind. Or. t. 199.

28. **S. pulcherrimus,** *And. in Thw. Enum.* 229 (1860).
Leptacanthus Walkeri, Nees, l. c. 170 (non Wight). C. P. 266 (301).
Fl. B. Ind. iv. 475.

Stems 3–6 ft., stout, cylindrical, glabrous, often pubescent above, becoming woody; l. 3–7 in., oval or lanceolate, acute at base, shortly acuminate, acute, faintly crenate-serrate, glabrous above, pubescent on veins beneath, petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; fl. rather large, numerous, drooping, on rather long divaricate glandular-hairy ped., in lax helicoid cymes combined to form large much-branched rather lax densely pubescent and glandular-hairy crimson pyramidal terminal panicles, bracts in pairs at every branch, small, oblong-oval or ovate, acute, green, glandular-hairy, floral bracts and bractlets none; sep. over $\frac{1}{2}$ in., unequal, narrowly linear, subacute, covered with long glandular hairs; cor. pubescent outside, tube $\frac{3}{4}$ in., funnel-shaped, lobes rather deep, rounded, crumpled, spreading; stam. included, fil. of longer pair with long white hair; capsule $\frac{5}{8}$ in., rather shorter than enlarged sep., ovoid, much compressed, pointed, slightly pubescent; seeds 4, with shaggy whitish hair.

Montane region, 4000-7000 ft.; gregarious, rather rare. Ambagamuwa; Madulkelle; Elk and Horton Plains, abundant. Fl. November-Feb.; pale pink-violet, cal. bright pink.

A lovely plant when in blossom, the whole inflorescence densely covered with long pink-purple spreading gland-tipped hairs, causing a rose-coloured halo in the sunlight. This is too striking a plant to be overlooked when in flower, and it is pretty certain that there was no general flowering between the seasons 1881–2 and 1893–4.

The Nilgiri plant referred to this by Wight, and figured in Wight, Ic. t. 1507, is different, *S. amabilis*, Clarke, and is said to be even more beautiful.

12. **BLEPHARIS,** *Juss.*

Perennial prostrate herbs, l. 4 in a whorl, unequal, fl. solitary, axillary, surrounded by 4 decussate imbricate pairs of spinous bracts (the inner pair bractlets (?)); sep. 4, in 2 pairs, outer pair the larger; cor.-tube short, inflated, limb quite without an upper lip, lower lip shortly 3-lobed; stam. 4, fil. thick, anth. 1-celled, densely bearded; capsule ovoid, with a solid base; seeds 2, oval or orbicular, flattened, with copious adpressed fibres composed of fascicles of hairs.—Sp. 20; 5 in *Fl. B. Ind.*

L. obovate-oval, coarsely toothed . . 1. B. BOERHAAVIÆFOLIA.
L. oblong, entire . . . . . . 2. B. MOLLUGINIFOLIA.

1. **B. boerhaaviæfolia,** *Pers. Syn.* ii. 170 (1807).
Acanthus maderaspatensis, L., Moon Cat. 46. Thw. Enum. 231. C. P. 2014.
Fl. B. Ind. iv. 478. Wight, Ic. t. 458.

Stems prostrate, rooting at the nodes, wiry, much divaricately branched, adpressed-pubescent; l. tapering to short petiole, two of each whorl twice as large as the others, $\frac{3}{4}$–$1\frac{1}{2}$ in., oval or obovate-oval, acute, with a few coarse serrations, slightly scabrous above, smooth and paler beneath, ciliate; fl. sessile or shortly pedicellate; bracts lax, somewhat spreading, rigid, spinous-ciliate, outermost pair oval, very short, innermost pair oblong-spathulate, shorter than sep.; sep. very unequal, upper one of outer pair nearly $\frac{3}{4}$ in., forming an upper lip to the fl., oblong, acute, leafy, lower one about $\frac{1}{2}$ in., linear-oblong, inner pair $\frac{1}{4}$ in., linear, membranous; cor.-tube subglobose, narrowed at the root, lower lip $\frac{3}{4}$ in., oval; fil. of anterior stam. produced into short points beyond anth., anth. densely bearded on margins with white hair; ov. glabrous, style tapering, stigma acute; capsule $\frac{1}{4}$ in., ovoid.

Dry region; common. Moon's locality is Kattregam. Fl. Feb., March; yellowish-white, veined with pinkish-purple.

Also in Peninsular India, Burma, and Trop. Africa.

2. **B. molluginifolia,** *Pers. Syn.* ii. 180 (1807).
Thw. Enum. 231. C. P. 3576.
Fl. B. Ind. iv. 479.

Stems prostrate, sometimes rooting at nodes, wiry, slender, slightly branched, slightly hispid-hairy; l. sessile, two of each whorl usually larger than the others, $\frac{1}{2}$–$\frac{3}{4}$ in., oblong, obtuse or subacute, entire, glabrous or slightly scabrid, rather fleshy, pale beneath; fl. sessile, 3 outer pairs of bracts oval, chartaceous, veined, with long spreading spines at the margin in

the upper part, innermost pair longer, boat-shaped, membranous, with only a terminal spine; sep. unequal, outer pair $\frac{3}{4}$ in., inner shorter, all linear, apiculate, membranous, veined; lower lip of cor. $\frac{1}{2}$ in.; capsule small, under $\frac{1}{4}$ in., completely enclosed in persistent sep. and bracts, ovoid, compressed, smooth.

Dry region, near the coast; rather rare. Jaffna; Mannar; Trincomalie; Batticaloa. Fl. Feb., March; bright violet.
Also in Peninsular India.

13. ACANTHUS, *L.*

Large perennial herb, l. opp., rigid, spiny, fl. large, in terminal spikes, bracts and bractlets large, nearly equal; sep. 4, in 2 pairs, nearly equal, large, ovate; cor.-tube very short, horny, upper lip entirely absent, lower slightly 3-lobed; stam. 4, very large, fil. equal, very thick; anth. connate, 1-celled, very densely bearded; disk 0, stigma shortly bifid; capsule ovoid, slightly compressed; seeds 4, orbicular, much compressed, testa much wrinkled, retinacula short.—Sp. 14; 7 in *Fl. B. Ind.*

A. ilicifolius, *L. Sp. Pl.* 939 (1753). **Ikili, Katu-ikili,** *S.*
Dilivaria ilicifolia, Juss., Moon Cat. 46. Nees in DC. Prod. xi. 268. Thw. Enum. 232. C. P. 2017 (2018).
Fl. B. Ind. iv. 481. Wight, Ic. t. 459.

Stems several, 2–4 ft., erect, scarcely branched, stout, cylindrical, glabrous; l. large, 4–6 in., oblong-oval or oblong-lanceolate, acute at base, acute or truncate at apex, with a few large sharply spinous teeth on each side terminating the lat. veins, glabrous and shining, coriaceous and rigid, venation conspicuous, petiole short, stout, usually with 2 stipule-like spines at the base, fl. sessile in opp. pairs, spike short, rather crowded, bracts and bractlets ovate, mucronate, glabrous; sep. $\frac{5}{8}$ in., obtuse, mucronate, adpressed-pubescent; cor. $1\frac{1}{2}$–2 in., lower lip obovate-oval, pubescent within, the middle lobe much the smallest; stam. over 1 in.; style slightly exceeding stam.; capsule about 1 in., blunt, apiculate, shining, bright brown.

Var. β, **integrifolius,** *And. in Thw. Enum.* 232.

L. lanceolate, with a terminal spine only.

Ditches, &c., near the seashore; common, especially in mangrove swamps. Fl. March, April, Sept.; bright purple-blue.
Also in S. India, Burma, Malaya, Australia, and the Philippine Is.

A conspicuous plant with its large flowers and holly-like leaves. It is remarkable that this was not noticed by Hermann, as it is very common about Colombo, and is an invariable undergrowth in mangrove swamps.

14. BARLERIA,* *L.*

Small shrubs or perennial herbs, l. opp., fl. usually large, axillary, solitary or rarely in spikes or cymes, bracts leafy or small or 0, bractlets either spinous or linear or oval, rarely large and pectinate-ciliate, very rarely 0; sep. 4, in pairs, outer much the larger; cor.-tube long, funnel-shaped above, lobes 5, usually nearly equal, strongly imbricate; perfect stam. 2, exserted, anth. 2-celled, not spurred, rudimentary stam. 2 or 3, minute; disk cup-shaped; style long, slightly bifid; capsule ovoid or oblong, without a solid base; seeds 4, rarely 2, flat, with silky adpressed hair, retinacula large.—Sp. 60; 26 in *Fl. B. Ind.*

Fl. yellow; capsule 2-seeded . . . 1. B. PRIONITIS.
Fl. blue or purple; capsule 4-seeded.
  Bractlets converted into spines.
    L. oval, outer sep. pubescent . . 2. B. MYSORENSIS.
    L. oblong, outer sep. glabrous . . 3. B. NOCTIFLORA.
  Bractlets not spinous.
    Bractlets linear or oval, entire.
      Fl. large, cor.-tube over 1 in.
        Bractlets linear (or 0).
          Fl. solitary or in threes . . 4. B. INVOLUCRATA.
          Fl. in lax cymes . . . 5. B. VESTITA.
        Bractlets oblong-oval . . . 6. B. ARNOTTIANA.
      Fl. small, cor.-tube under $\frac{3}{4}$ in. . 7. B. NUTANS.
    Bractlets ovate, pectinate-ciliate . 8. B. NITIDA.

1. **B. Prionitis,** *L. Sp. Pl.* 636 (1753). **Katu-karandu,** *S.*
Herm. Mus. 43, 25. Burm. Thes. 8. Fl. Zeyl. n. 233. Moon Cat. 46. Thw. Enum. 230. C. P. 2012.
Fl. B. Ind. iv. 482. Wight, Ic. t. 452.

A small shrub, 2–4 ft., much branched, bark white, branchlets cylindrical, swollen above nodes, glabrous, with small, slender, very sharp spines (abortive branches or fl.) in the axils each with 3 divaricate branches; l. $3\frac{1}{2}$–5 in., passing into bracts above, ovate, tapering below, acute, mucronate, glabrous above, slightly pubescent on veins beneath, copiously lineolate, venation pellucid, lat. veins prominent beneath; fl. sessile, rather large, solitary, opp., becoming spicate above, bractlets linear, mucronate, stiff, almost spinous, spreading; sep. longer than bractlets, acuminate, mucronate, glabrous,

* Commemorates J. Barrelier, a French botanist of the 17th century.

outer pair ovate, inner linear-lanceolate; cor. about 1 in., tube cylindrical, pubescent outside, limb 1–1¼ in. diam., lobes nearly equal, rounded, recurved, the two lat. ones broader; fil. of rudimentary stam. very short; disk small, entire; capsule about ¾ in., ovoid, with a long tapering solid beak, compressed; seeds 2.

Open places in the dry region; common. Fl. March, August; bright pale orange-yellow.

Throughout Tropical Asia and Africa.

The whole plant, and especially the root, is much used as a diuretic and tonic medicine.

[*B. buxifolia*, L. According to Anderson (in Journ. Linn. Soc. vii. 115), the specimen of this in Linnæus's own Herbarium is marked as from Ceylon; but this locality is not mentioned in his later papers. Nees (in DC. Prod. ix. 241) also gives Ceylon for his var. β of this species on the faith of a specimen from 'Forsyth' in Hb. De Candolle. It is a plant of S. India, and differs from *B. mysorensis* in the oblong entire outer sepals. Figured in Wight, Ic. t. 870.]

2. **B. mysorensis,** *Roth. Nov. Sp. Ind. Or.* 313 (1821). **Katunelu,** *S.* **Kirimulla, Kikkiri, Ikkiri,** *T.*

B. buxifolia, Moon Cat. 46 (non L.). *B. spina-zeylanica*, Nees, l. c. 242. And. l. c. 490. *B. bispinosa*, Nees, l. c. 241 (non Vahl). Thw. Enum. 230. C. P. 2013.

Fl. B. Ind. iv. 484.

A small shrub, intricately branched, branchlets hairy; l. very numerous, closely placed, small, ½–1¼ in., obovate-oval, acute at base, rounded, mucronate, ciliate, nearly glabrous above, hairy beneath, venation pellucid; fl. rather large, solitary in alt. axils, sessile, bracts 0, bractlets represented by a pair of slender horizontal divaricate spines ¼–⅝ in. long; sep. extremely unequal, outer pair ¾ in., broadly ovate or rotundate, obtuse, spinous-serrate, then becoming membranous, pubescent, inner pair ¼ in., linear-subulate; hairy; cor.-tube ¾ in., narrow, slightly dilated upwards, limb 1¼ in. diam., lobes obtuse, recurved, lat. ones rather longest; rudimentary stam. filiform, very small; disk half as long as ov., lobed; capsule ⅝ in., enclosed in large persistent sep., ovoid-oblong, acute; seeds 4.

Dry region; very common. Fl. Feb.–August; bright violet-blue.

Also in S. India.

A very pretty little shrub when well grown, but often found on the most barren rocks and flats gregariously, as at Jaffna, and then very stunted and of no beauty. In the lower axils the fl. are usually abortive, but the pair of spinous bractlets are always developed.

3. **B. noctiflora,** *Linn. f. Suppl. Pl.* 290 (1781).

Nees in DC. Prod. xi. 240. Thw. Enum. 231. Trim. Syst. Cat. Ceyl. 66.

Fl. B. Ind. iv. 484.

'Small undershrub, with numerous pubescent branches, l. $\frac{3}{4}$ in., oblong or narrowly obovate, obtuse or acute, mucronate, pubescent but becoming glabrous, nearly sessile; fl. axillary, solitary, bractlets $\frac{1}{4}$–$\frac{3}{4}$ in., spinous, branched; outer sep. $\frac{3}{4}$ in., ovate, acute, spinous-dentate, becoming membranous, veined, nearly glabrous; cor.-tube $1\frac{1}{4}$ in., narrow, pubescent outside, lobes ovate, rounded; capsule $\frac{2}{3}$ in.; seeds 4.'

Ceylon, 1796 (Rottler). The specimens are in Hb. Kew.

Differs from *B. mysorensis* but slightly; the above description is from Fl. B. Ind.

4. **B. involucrata**, *Nees in Wall. Pl. As. Rar.* iii. 92 (1832).
B. pentandra, Nees, l. c. 232; Thw. Enum. 230 (part). And. l. c. 492. C. P. 310.
Fl. B. Ind. iv. 485. Wight, Ill. t. 164 (a small-flowered form).

Shrubby, stems scrambling and semi-scandent, much-branched, stout, quadrangular or cylindrical, sparingly hispid, succulently swollen above the nodes; l. large 5–8 in., oval, attenuate and decurrent on petiole at base, caudate-acuminate, acute, entire, more or less hairy on both sides, lineolate above, petiole obscure, fl. very large, on short stout ped., solitary or in threes on a short peduncle in opp. axils, bracts and bractlets $\frac{1}{2}$–1 in., linear, acute, spreading; outer lip $1\frac{1}{4}$–$1\frac{1}{2}$ in., ovate-lanceolate, acuminate, subacute, bristly hairy, parallel-veined, whitish, inner pair about half as long, much narrower; cor.-tube about $1\frac{1}{2}$ in., limb $2\frac{1}{2}$–3 in. diam., lobes nearly equal, rounded or acute; stam. exserted, anth. large, pale blue; capsule $1\frac{1}{4}$ in., ovoid, compressed, pointed; seeds 4.

In bushy places, montane zone 3000–7000 ft.; rather rare. Ambagamuwa; Hewaheta; N. Eliya; Horton Plains. Fl. Sept.–Feb.; clear brilliant purple-blue, with tube darker.

Also (var. *elata*) in Malabar.

The beautiful flowers are not coloured as in Wight, Ill. The whole plant dries blackish. The length of the bracts and bracteoles, the width of sep., and the size of cor. vary greatly. Anderson in Thw. Enum. confounded this with *B. pentandra*, Arn.

5. **B. vestita**, *And. in Thw. Enum.* 230 (1860).
Barleria pentandra, var. β, Nees, l. c. 233. C. P. 2004.
Fl. B. Ind. iv. 486. Bedd. Ic. Pl. Ind. Or. t. 263.

Herbaceous, stem 6–8 ft., stout, nearly cylindrical, swollen above the nodes, shaggy with long spreading yellow hair; l. large, 5–10 in., oblong-oval, sessile or nearly so, tapering at base, narrowly caudate-acuminate, acute; entire, coarsely hairy or shaggy on both sides; fl. very large, numerous, on short ped., in lax, shaggy axillary and terminal dichotomous

cymes, peduncles 2–2½ in., bracts linear, opp., hairy, bractlets 0; outer sep. 1–1¼ in., oblong- or ovate-lanceolate, acuminate, acute, densely hairy, inner pair shorter and narrower; cor.-tube 1½–2 in., limb 2½–3 in. diam., 2 upper lobes nearly as long as tube, narrowly oblong, erect, rest oval, spreading, stam. exserted, anth. yellow; capsule not seen.

Moist region up to 4000 ft.; rare. Maskeliya; Ambagamuwa; Hewesse; Ramboda. Fl. Sept.–Dec.; white or pale bluish-violet, with no darker colouring, the large outer sepals white, with green or purplish bases and tips.

Endemic.

6. **B. Arnottiana,** *Nees in DC. Prod.* xi. 232 (1847).
Thw. Enum. 230. And. l. c. 492. C. P. 682.
Fl. B. Ind. iv. 486.

Herbaceous, stems branched, cylindrical, coarsely adpressed-hairy; l. 2½–4 in., oval, acute at base, shortly acuminate, acute, entire, slightly and roughly hairy above and much lineolate, densely and softly adpressed-hairy beneath, petiole short, hairy; fl. large, usually solitary, on very short ped., bractlets small, oblong-oval, acute; outer sep. over 1 in., ovate, acute, hairy, inner pair about half as long, linear, very acute; cor.-tube rather over 1 in.; limb about 2 in. diam., lobes large, oval, obtuse, lower much shorter than rest, recurved; anth. dark blue; capsule 1 in., pointed; seeds 4, much flattened.

Var. β, **glabra,** *Trim.* *B. pentandra*, Arn. in DC. Prod. xi. 232 (chiefly). Thw. Enum. 230 (part). C. P. 2558. [PLATE LXXI.]

Stem and l. nearly or quite glabrous, l. more tapering to both ends; bractlets linear-setaceous; outer sep. 1½ in., finely pubescent.

Upper montane zone; rather common. About N. Eliya, Horton Plains, &c. Var. β in the low country at Haragama. Fl. Sept.–Feb.; bright light blue with a paler tube.

Also (var. *Beddomei*) in Burma.

Var. β is probably the true *B. pentandra* of Arnott, but the name is better abandoned, having been applied to more than one species.

B. cristata, L. (non Lam.), is very commonly cultivated in gardens, but is not a native here. Moon (Cat. 46) gives Jaffna as a locality, and it is C. P. 2899.

7. **B. nutans,** *Nees in DC. Prod.* xi. 227 (1847).
Thw. Enum. 230. C. P. 2011.
Fl. B. Ind. iv. 488. Bedd. Ic. Pl. Ind. Or. t. 264.

Semi-shrubby, stem much branched, sub-quadrangular, glabrous; l. 4–6 in., oval, much tapering to base and decurrent on petiole, very acuminate, acute, glabrous, petiole obscure;

fl. small, sessile, numerous, in close terminal and axillary spikes, bracts and bractlets equal and similar, linear, glandular-pubescent; sep. about $\frac{1}{2}$ in., much longer than bracts, outer pair oblong, parallel-veined, glandular-pubescent, one rather longer and acuminate, the other deeply bifid, inner ones linear; cor.-tube $\frac{1}{2}$–$\frac{3}{4}$ in., funnel-shaped, limb $\frac{1}{2}$–$\frac{3}{4}$ in. diam., lobes rounded; anth. purple; capsule $\frac{3}{4}$ in., compressed, pointed, slightly pubescent; seeds 4, circular, very flat.

Moist region, 2000–3000 ft.; rare? Alagala; Hantane. Fl. Jan.; pale violet with white tube.

Endemic.

8. **B. nitida,** *Nees in Wall. Pl. As. Rar.* iii. 91 (1832).
Thw. Enum. 443. Trim. Syst. Cat. Ceyl. 66. C. P. 3849.
Fl. B. Ind. iv. 490 (not given for Ceylon). Wight, Ic. t. 454.

Shrubby, twigs coarsely adpressed-hairy; l. small, $1\frac{1}{4}$–$2\frac{1}{2}$ in., oval, acute at both ends, nearly glabrous above, coarsely hairy on veins beneath, conspicuously lineolate, petiole $\frac{1}{4}$ in.; fl. rather small, sessile, in short dense terminal capitulate spikes, bractlets nearly 1 in., oval, acute, pectinate-ciliate, membranous, veined, with coarse strigose hair on the veins outside, glabrous within; outer pair of sep. quite similar to the bractlets, inner ones $\frac{3}{8}$ in., oblong-linear, obtuse, hairy; cor.-tube $\frac{3}{4}$ in., slender, limb about 1 in. diam., lobes rounded; capsule not seen.

Dry country; very rare. Trincomalie (Glenie).

Also in S. India.

The specimens are very poor, and scarcely sufficient for description.

15. **CROSSANDRA,** *Sal.*

Undershrub, l. opp. or in whorls of 4, fl. moderate-sized, sessile in dense stalked axillary spikes, bracts lanceolate, much imbricate, bractlets linear; sep. 5, linear or lanceolate, very thin, 2 inner smaller; cor.-tube long, slender, limb split down back and forming a single flattened lip, obtusely 5-lobed; stam. 4, included in cor.-tube, anth. small, 1-celled; stigma slightly 2-lipped; capsule oblong-ovoid, acute; seeds 4, orbicular, compressed, densely covered with large scarious scales, retinacula much curved.—Sp. 5; 1 in *Fl. B. Ind.*

C. undulæfolia, *Salisb. Parad. Lond.* t. 12 (1806).
C. infundibuliformis, Nees, l. c. 280. Thw. Enum. 231. C. P. 255, 2016.
Fl. B. Ind. iv. 492. Wight, Ic. t. 461. Bot. Mag. t. 2186.

A small undershrub, branches ascending, cylindrical,

glabrous, l. 4 in a whorl (or rather 2 decussate pairs inserted close to one another), 3–6 in., lanceolate, very much attenuate at base and decurrent on petiole, acuminate, obtuse, entire, undulate, glabrous and shining on both sides, rather thick, petiole long, obscure; fl. numerous, peduncles stout, spikes 3–6 in., narrow, quadrangular, bracts in four ranks, much overlapping, $\frac{3}{4}$ in., lanceolate, acuminate, mucronate, with copious long white hair, bractlets $\frac{1}{2}$ in., linear, very silky-hairy; sep. as long as bractlets, hyaline, with long silky hair at top; tube of cor. much exserted, $\frac{3}{4}$ in., limb 1–1$\frac{1}{2}$ in. diam.

Var. β, **crocea,** *Trim.*

Spikes shorter and broader, 1–3 in., on longer peduncles; bracts broader, less acuminate, with the hairs more spreading; bractlets nearly as long as bracts; leaves puberulous beneath, dull (not shining) above.

Var. γ, **axillaris.** *C. axillaris*, Nees. Wight, Ic. t. 460.

Bracts without spreading hairs.

Low country; rather common, chiefly in the dry districts. Var. β, Uma-oya (common in gardens). Var. γ, Kurunegala. Fl. all the year; especially July–Sept.; salmon-red. Var. β, dull orange-yellow.

Also in Peninsular India.

The ordinary form with salmon-red flowers is a well-known hot-house plant in Europe.

16. ASYSTASIA, *Bl.*

Semi-scandent perennials, l. opp., fl. moderate-sized, in spikes, racemes, or panicles, bracts and bractlets small, inconspicuous; sep. 5, narrow, equal; cor.-tube funnel-shaped, somewhat ventricose, lobes 5, equal, imbricate; stam. 4, didynamous, inserted near base of cor.-tube, anth. not spurred; disk annular; stigma minutely bifid; capsule clavate, with a long solid base; seeds 4, circular, flattened, glabrous, nodular or tuberculate.—Sp. 15; 10 in *Fl. B. Ind.*

Infl. racemose: stem bluntly quadrangular . 1. A. COROMANDELIANA.
Infl. paniculate . . . . 2. A. CHELONIOIDES.
Infl. spicate; stem sharply quadrangular . 3. A. VARIABILIS.

1. **A. coromandeliana,** *Nees in Wall. Pl. As. Rar.* iii. 89 (1832).
Puruk, *S.* **Péyppáṭchotti,** *T.*

Ruellia zeylanica, Kœn., Moon Cat. 46. Nees in DC. Prod. xi. 165. *A. gangetica*, And. in Thw. Enum. 235. C. P. 1988.
Fl. B. Ind. iv. 492. Wight, Ic. t. 1506.

Stems very long, much branched, scandent by means of the divaricate branches and petioles, bluntly quadrangular,

glabrous, stiff; l. 2–3 in., ovate, rounded or subcordate at base, acute, entire or very faintly crenate, glabrous and very dark green above, paler and slightly pubescent on veins beneath, petiole ½–1½ in., very narrowly bordered by decurrent l.-base; fl. rather large, numerous, on short ped., in long, lax, unilateral, erect, terminal and axillary, spike-like racemes, bracts and bractlets very small, ovate, acute, ciliate; sep. linear, acute, pubescent; cor.-tube about ¾ in., narrowly funnel-shaped, puberulous outside, limb 1–1¼ in. diam., lobes rounded; capsule 1 in., clavate, pointed, pubescent; seeds tuberculate.

Low country in the dry region, especially near the coast, very common; in the moist country less so. Fl. Jan., Feb.; pure white, with a yellowish tube and a purple blotch on the lowest lobe.

Throughout India, Malaya, Arabia, Trop. Africa.

The colour of the flowers is incorrectly given in Fl. B. Ind.; being of considerable size, they are very ornamental. The *A. violacea* of Bot. Mag. t. 5882 quoted for this in Fl. B. Ind. seems a very different species.

2. **A. chelonioides,** *Nees in Wall. Pl. As. Rar.* iii. 89 (1832).
Nees in DC. Prod. xi. 165. Thw. Enum. 236. C. P. 1989.
Fl. B. Ind. iv. 494.

Stems long, branched, scrambling but scarcely scandent, quadrangular, swollen above the nodes, glabrous; l. 3–6 in., oval, acute or rounded at base, caudate-acuminate, usually slightly crenate, minutely scabrous-pubescent on both sides, petiole of upper l. very short, of lower l. 1–2 in.; fl. moderate-sized, numerous, on slender ped. ¼ in. long, in lax, erect, terminal panicles, bracts and bractlets very small, acute; sep. linear-lanceolate, acute, densely pubescent; cor.-tube ⅝ in., subcampanulate, inflated, slightly pubescent outside, limb over ¾ in. diam., lobes rounded; capsule nearly 1¼ in., pointed, finely pubescent, solid base very long, valves much recurved after dehiscence; seeds greyish-yellow, much lobulated.

Shady places in montane zone to 6000 ft.; rather common. Ambagamuwa; Pusselawe; Ramboda; Maturata; Sita Eliya, near Hakgala; Maskeliya. Fl. March–May, Aug.–October; pale purple, densely sprinkled in the throat with purple dots.

Also in S. India, but doubtfully wild there.

3. **A. variabilis,** *Trim.*
Ruellia variabilis, Moon Cat. 46 (1824). *A. coromandeliana*, var. γ, *variabilis*, Nees in DC. Prod. xi. 165. *A. chelonioides*, Thw. Enum. 236 (part). *A. nemorum*, Nees, var. β, *angustifolia*, Thw. ex And. in Journ. Linn. Soc. ix. 525. *A. quadrangularis* (Heyne), Trim. Syst. Cat. 67. C. P. 552.
Fl. B. Ind. iv. 494 (*A. chelonioides*, var. *quadrangularis*).

Stems long, semi-scandent, with many divaricate branches, stout, slightly swollen above nodes, acutely quadrangular with

concave sides, glabrous, usually purplish; l. very variable, 1½–4 in., usually oval or ovate-oval, but often lanceolate or linear, shortly acuminate, acute, entire or faintly crenate, glabrous or slightly pubescent on veins; fl. rather small, sessile, in lax, erect, axillary, stalked spikes, bracts and bractlets very small, triangular, acute, pubescent; sep. linear, acute; cor. ¾ in. long, finely pubescent outside, tube bent near the base, floor flattened and channelled, lobes nearly equal, the 4 upper recurved, the lower convex not recurved; fil. nearly equal; capsule 1 in., pointed, densely pubescent; seeds yellowish-grey, tuberculate.

Moist low country up to 3000 ft.; rather common. Abundant about Kandy. Fl. Aug., Sept.; pale violet, lowest lobes darker, tube reddish, dotted beneath.

Also in the Anamalai Hills, S. India.

I have little doubt that this is Moon's *Ruellia variabilis*, as it was sent home under that name by Macrae. It seems a fairly well-marked species, and is a very common weed in the grass and among bushes at Peradeniya. The width of the leaves is extremely variable. Dries blackish.

17. ERANTHEMUM, *L.*

Semi-shrubby, l. opp., fl. rather large, nearly sessile, in interrupted spikes, bracts and bractlets very small; cal. much longer than bracts, very deeply cut into 5 equal narrow segm.; cor.-tube long, cylindrical, narrow, limb slightly 2-lipped, lobes 5, imbricate, nearly equal, lowest rather the broadest; stam. 2, inserted in throat of cor., fil. very short, imperfect stam. 2, very small; ov. glabrous, stigma bilobed; capsule clavate, with a narrow solid base half its length; seeds 4, orbicular, flattened, glabrous, rugose.—Sp. 30; 10 in *Fl. B. Ind.*

E. malabaricum, *Clarke in Fl. B. Ind.* iv. 497 (1884).
E. crenulatum, Thw. Enum. 235 (non Lindl.). C. P. 1703, 1979.
Fl. B. Ind. iv. 497.

Stem 1½–2 ft., somewhat branched, erect, cylindrical, glabrous, bark papery; l. 2½–5 in., oval, tapering to base, acuminate, obtuse or acute, faintly crenate, glabrous, rather thick, shining above, lineolate, petiole obscure; fl. in opp. clusters of 1–3, whorls distant, on a long erect terminal spicate infl., bracts and bractlets lanceolate, acute, puberulous; cal.-segm. linear, acute, finely pubescent; cor.-tube ¾ in., nearly straight, lobes oblong-oval, obtuse, spreading; capsule 1 in., pointed, slightly indented between the seeds.

Low country to 3000 ft.; rather common. Fl. Feb.–June; white, cal. and ped. deep purple.

Also in S India.

18. ANDROGRAPHIS, *Wall.*

Annual herbs, l. opp., entire, fl. rather small, in usually lax axillary racemes or panicles, bracts and bractlets very small; sep. 5, very narrow; cor. more or less conspicuously 2-lipped, pubescent outside, lobes imbricate; stam. 2, exserted, anth. 2-celled, bearded at base; capsule narrow, compressed; seeds 8–16, not compressed, glabrous, rugose.—Sp. 19; all in *Fl. B. Ind.*

L. acute, glabrous.
  All l. lanceolate; angles of stem acute.
    Cor. under ½ in. . . . . . 1. A. PANICULATA.
    Cor. ¾ in. . . . . 2. A. MACROBOTRYS.
  Upper l. linear; angles of stem winged 3. A. ALATA.
L. very obtuse, hairy . . . . . 4. A. ECHIOIDES.

1. **A. paniculata,** *Nees in Wall. Pl. As. Rar.* iii. 116 (1832). **Hin-bin-kohomba,** *S.* **Nila-vempu,** *T.*

Justicia paniculata, Burm. f. Fl. Ind. 9. Moon Cat. 3. Thw. Enum. 232. C. P. 3664.

Fl. B. Ind. iv. 501. Wight, Ic. t. 518. Bentl. & Trim. Med. Pl. t. 197.

Stem 1–2 ft., erect, sharply quadrangular, glabrous; l. 2–3½ in., lanceolate, tapering to both ends, entire, slightly undulate, glabrous, paler beneath, petiole obscure; fl. small, on slender divaricate pubescent ped., solitary, distant, in very lax, spreading, axillary and terminal racemes or panicles, the whole forming a large pyramidal paniculate infl., bracts and bractlets equal, very small, subulate; sep. linear, acute, pubescent, often slightly glandular; cor. under ½ in., glandular-pubescent outside, lips spreading, as long as tube, upper one 2-, lower one 3-toothed; fil. flat, coherent at apex, with a tuft of deflexed hair beneath anth.; capsule ¾ in., linear, compressed, acute at both ends, glabrous, yellowish; seeds usually 6 in each cell, ovoid, truncate at ends.

Var. β, **glandulosa,** *Trim. in Journ. Bot.* xxvii. 165.

Stem and l. densely glandular-pubescent; l. smaller, upper surface finely hispid; fl. rather larger, capsule glandular-pubescent.

Low country; rare. Negombo (Moon); Reigam Korale (Thwaites). Var. β, Maturata at 5000 ft. Fl. March and Sept.; pink.

Throughout Peninsular India.

A valuable and much-used bitter tonic and febrifuge. It is an official drug in the Indian Pharmacopœia.

2. **A. macrobotrys,** *Nees in DC. Prod.* xi. 516 (1847).

Thw. Enum. 232. *A. Wightiana,* Nees, And. in Journ. Linn. Soc. ix. 502. C. P. 3578.

Fl. B. Ind. iv. 503.

Stem 2–4 ft., quadrangular, nearly glabrous, often slightly rough on angles, purple at nodes; l. $2\frac{1}{2}$–$3\frac{1}{2}$ in., on very short petioles, linear-lanceolate, acute at base, acuminate, acute, entire, glabrous; fl. on very short ped., distant, on spreading branches of elongated glandular-hairy, very lax, axillary racemes or panicles much longer than l., bracts and bractlets acicular, longer than ped.; sep. linear-lanceolate, very acute; cor. about $\frac{3}{4}$ in., glandular-pubescent outside; lobes acute; capsule nearly 1 in., linear, slightly glandular-pubescent.

Var. β, **parvifolia,** *Clarke, l. c.* *A. zeylanica,* Nees, l. c. 518 (non Wight). Thw. Enum. 232.

L. smaller, 1–$1\frac{3}{4}$ in.

Moist region; very rare. About Kandy and Peradeniya. Var. β I have not seen. Fl. July; whitish, the upper lip and tube stained with dull brownish-purple.

Also in S. India.

Dries black. Differs from 1, chiefly in its more lax and less pyramidal inflorescence.

[*A. zeylanica,* Wight, Ic. t. 1560, is referred to a variety of *A. viscosula,* Nees in Fl. B. Ind. vi. 504—a S. Indian species not found in Ceylon.]

3. **A. alata,** *Nees in DC. Prod.* xi. 516 (1847).

Thw. Enum. 232. C. P. 1977.

Fl. B. Ind. iv. 502.

Stem 2–4 ft., erect, much branched above, sharply quadrangular with the angles narrowly winged above, glabrous, lower l. 2–$3\frac{1}{2}$ in., ovate, rounded at base, but suddenly narrowed and forming a border on petiole, acute, upper l. linear, all entire, glabrous; fl. on slender pubescent ped. distantly placed on winged branches of very lax spreading panicle, bracts and bractlets minute; sep. linear, very acute, pubescent; cor. about $\frac{1}{2}$ in., pubescent, obscurely 2-lipped, lobes obtuse; capsule $\frac{3}{4}$ in., linear, finely pubescent; seeds 6–8 in each cell.

Dry region; rare. Venloos Bay (Gardner); Bintenne Dist. Fl. July; white and pink.

Also in S. India.

4. **A. echioides,** *Nees in Wall. Pl. As. Rar.* iii. 117 (1832). **Hakan,** *S.* (Moon).

Herm. Hort. Acad. Lugd.-Bat. 668; Mus. 13. Burm. Thes. 88. Fl. Zeyl. n. 21. *Justicia echioides,* L. Sp. Pl. 16. Moon Cat. 3. Thw. Enum. 232. C. P. 606.

Fl. B. Ind. iv. 505. Herm. Hort. Acad. Lugd.-Bat. t. 669. Burm. Thes. t. 38, f. 1 (bad). Wight, Ic. t. 467.

Stem 8–18 in., erect, stiff, with a few spreading branches from the base, densely covered with long white spreading hair; l. sessile, $1\frac{1}{2}$–3 in., oblong, narrowed to base, very obtuse, hairy on both sides; fl. numerous, sessile or nearly, erect, rather closely placed on the upper side of short, divaricate or recurved, glandular-hairy, axillary racemes shorter than the l., bracts and bractlets very small; sep. linear-filiform, densely glandular-hairy, elongating with fruit; cor. under $\frac{1}{2}$ in., pubescent outside; capsule $\frac{3}{8}$ in., lanceolate, about twice as long as broad, acute, slightly pubescent.

Low country, in the dry region, common; in the moist region, rare, and only on the coast as at Colombo and Kalutara. Fl. Dec.–March; pink.

Also in Peninsular India.

Very different in habit to the other species. Hermann gives the S. names, 'Kawatumba' and 'Kaktumba,' for this. Linnæus has a var. β, to which he refers Burmann's figure, which represents a luxuriant specimen apparently.

19. GYMNOSTACHYUM, *Nees.*

Perennial herbs, l. opp.; fl. moderate-sized in terminal or axillary paniculate cymes, bracts and bractlets very small (except in 5); sep. 5, often slightly connate at base, equal, narrow; cor.-tube long, slender, limb small, 2-lipped, lobes 5, short, nearly equal, imbricate; stam. 2, anth. 2-celled, cells equal, oblong, sometimes spurred at the base; capsule linear, slightly compressed; seeds 8–16 or more, compressed, slightly hairy.—Sp. 15; 13 in *Fl. B. Ind.*

All our species are endemic.

Bractlets small, much shorter than sep.
  Cymes large, terminal.
    Stem short, leafy at base only.
      L. glabrous above . . . 1. G. ZEYLANICUM.
      L. hairy above . . . 2. G. THWAITESII.
    Stem long, leafy throughout . 3. G. PANICULATUM.
  Cymes small, axillary . . . 4. G. SANGUINOLENTUM.
Bractlets filiform, as long as sep. . 5. G. HIRSUTUM.

1. **G. zeylanicum,** *Arn. and Nees in DC. Prod.* xi. 93 (1847).
Thw. Enum. 232. C. P. 2019.
Fl. B. Ind. iv. 508. Bedd. Ic. Pl. Ind. Or. t. 265.

Rhizome prostrate, pubescent, giving off long roots, stem short, erect, stout, unbranched, cylindrical, densely pubescent; l. few, closely placed, 2–4 in. (rarely larger), broadly oval, more or less tapering at base, obtuse, shallowly crenate, glabrous but rather harsh with lineolæ above, finely pubescent and paler beneath, stiff, often somewhat bullate between the

veins, venation reticulate, prominent beneath, petiole $\frac{1}{2}$–1 in., stout, fl. small, numerous, on ped., in erect spicate glandular-pubescent terminal panicles, peduncles variable in length, often with a pair of small l. near base, bracts and bractlets very small, shorter than ped., linear, glandular-pubescent; sep. linear-subulate, glandular-pubescent; cor.-tube $\frac{1}{2}$ in., narrow, slightly inflated at base, bent a little below the middle, upper lip erect, 2-lobed, lower lip 3-lobed, middle lobe broader and shorter; anth. slightly exserted; ov. on a globose base, oblong, puberulous, with about 6 ovules in each cell, style very long; capsule $\frac{1}{2}$ in., puberulous.

Dry and intermediate regions, rare, in shady places. Gonagama (Gardner); Bintenne Dist. (Thwaites); Medamahanuwara. Fl. March–August; cor.-tube pink, limb greenish-yellow or all lemon-yellow.
Endemic.
A pretty little plant much cultivated in gardens; the leaves are usually variegated with white along the veins on upper surface.

2. **G. Thwaitesii,** *And. in Thw. Enum.* 232 (1860).
C. P. 3356.
Fl. B. Ind. iv. 508. Bedd. Ic. Pl. Ind. Or. t. 255.

Rhizome creeping, stem short, densely woolly-pubescent; l. few near the base of the stem, 2–3 in., broadly oval, acute at base, very obtuse or rounded, entire, undulate, sparsely hairy on both sides, petiole about 1 in., woolly; fl. numerous on short pubescent ped., in lax, elongated, erect, glandular-pubescent, paniculate cymes, bracts short, linear or subulate; sep. linear, glandular-pubescent; cor. $\frac{3}{8}$ in., lobes very short, rounded; capsule scarcely $\frac{1}{2}$ in., pubescent; seeds about 6 in each cell, small, compressed.

Moist region; very rare. Ambagamuwa Dist. Fl. Dec.
Endemic.
I have not seen this living.

3. **G. paniculatum,** *And. in Thw. Enum.* 232 (1860).
C. P. 2994.
Fl. B. Ind. iv. 508. Bedd. Ic. Pl. Ind. Or. t. 232.

Stem $1\frac{1}{2}$–2 ft., erect, quadrangular, roughly pubescent or nearly glabrous; l. not restricted to base of stem, 3–7 in., oval, much tapering on petiole, acuminate, subacute, faintly serrate-dentate, pubescent on both sides or only on veins beneath, copiously lineolate, petioles $\frac{1}{2}$–1 in., obscure; fl. rather large, sessile or nearly so, on divaricate branches of rather dense, glandular-hairy, pyramidal, elongated, terminal, paniculate cymes, bracts small, linear-lanceolate; sep. linear-lanceolate, acute, glandular-hairy; cor. $\frac{3}{4}$ in., glandular-hairy

outside, tube narrow, cylindrical, curved, lobes acute; capsule $\frac{5}{8}$ in., slightly pubescent ; seeds 4–6 in each cell.

Moist low country below 2000 ft.; rather rare. Hiniduma Kande; Galle Dist.; Rakwane. Fl. May and Sept.–Dec.; deep purple outside, the limb greenish-yellow within.

Endemic.

Dries black.

4. **G. sanguinolentum,** *And. in Thw. Enum.* 232 (1860).
Justicia sanguinolenta, Vahl, Symb. Bot. ii. 10. *Cryptophragmium sanguinolentum*, and *C. axillare*, Nees, l. c. 97. Thw. Enum. 232. C. P. 186.

Fl. B. Ind. iv. 510. Wight, Ic. t. 1496 (*Crypt. axillare*).

Stem 2–3 ft., erect, stout, bluntly quadrangular, glabrous; l. 3–6 in., ovate-oval, tapering at base, acuminate, acute, entire or obscurely crenate, glabrous; fl. on glabrous ped., in small dichotomous divaricate, axillary cymes much shorter than l., bracts small, linear; sep. linear, acuminate, glabrous; cor. over $\frac{1}{2}$ in., slightly glandular-pubescent outside, tube slightly curved, lobes subacute; capsule $\frac{5}{8}$ in., glabrous; seeds 6–8 in each cell.

Shady places in moist region up to 4000 ft.; rather common. Ramboda (Wight); Panwila; Hewaheta; Balangoda. Fl. April and October; purple, with the lower lip paler.

Endemic.

The whole plant except the leaves has a reddish-purple tinge. Dries blackish. The leaves are sometimes linear. First collected by Kœnig.

5. **G. hirsutum,** *And. in Thw. Enum.* 233 (1860).
C. P. 2473.

Fl. B. Ind. iv. 510. Bedd. Ic. Pl. Ind. Or. t. 249 (not good).

Stems 2–3 ft., erect, branched, bluntly quadrangular, glabrous; l. 3–6 in., ovate-lanceolate, suddenly acute at base, shortly acuminate, acute, entire, slightly hairy above, much more so beneath, petiole 1–1$\frac{1}{2}$ in.; fl. numerous, sessile in dense axillary and terminal cylindrical spicate cymes, bractlets $\frac{5}{8}$ in., filiform-setaceous, ciliate with very long hair; sep. slightly connate below, as long as bractlets and quite like them; cor.-tube scarcely exceeding sep., lobes acute ; capsule $\frac{5}{8}$ in., glabrous; seeds 4–6 in each cell.

Forests in lower montane zone; rare. Maturata; Uda-Pussellawe. Fl. April–July ; greenish-yellow, the calyx and bracts reddish-purple.

Endemic.

The whole plant is tinged with purple. The long ciliate bractlets and sep., and the crowded dense inflorescence give this a very different appearance from the other species.

20. LEPIDAGATHIS, *Willd.*

Perennial herbs, l. opp., more or less toothed, fl. small, sessile, in dense heads or spikes, bracts and bractlets conspicuous, pubescent or ciliate; sep. 5, similar to the bractlets, the 2 inner much narrower; cor.-tube ventricose, limb distinctly 2-lipped, lower lip 3-lobed, spreading; stam. 4, didynamous, anth. 2-celled, one cell often a little lower than the other, not spurred; capsule small; seeds 4, compressed, hairy, retinacula large, hooked.—Sp. 50; 24 in *Fl. B. Ind.*

Fl. in unilateral spikes . . . . 1. L. HYALINA.
Fl. in rounded heads.
  L. glabrous above.
    Bractlets ½ in. . . . . 2. L. ZEYLANICA.
    Bractlets ¼ in. . . . . 3. L. WALKERIANA.
  L. hairy above . . . . 4. L. FASCICULATA.

1. **L. hyalina,** *Nees in Wall. Pl. As. Rar.* iii. 95, var. **lophostachyoides,** *Nees in DC. Prod.* xi. 252 (1847).
Thw. Enum. 231.
Fl. B. Ind. iv. 531.

Stems 1½–2 ft., semi-shrubby at base, stout, nearly cylindrical, glabrous, lower nodes often rooting; l. rather large, 2½–4 in., lanceolate, much tapering into petiole, acuminate, acute, shallowly undulate-dentate, quite glabrous on both sides, pale beneath, with prominent venation, petiole ½–¾ in.; fl. numerous, very densely crowded in close unilateral, terminal, and axillary spikes 1–2 in. long, bracts and bractlets similar, linear, very acute, hairy, the former imbricated along the back of the spike; sep. as long as bractlets, linear-lanceolate, mucronate, strongly ciliate, 2 innermost narrower; cor. about ½ in.; capsule ¼ in.

Dry bushy places in the moist region, 2000–4000 ft.; rather common. Fl. December, January; white with brownish spots.

Our var. endemic (?) (the type throughout India, Burma, S. China). Varies with linear leaves.

2. **L. zeylanica,** *Nees, Monogr. Lepidag.* 35 (1841).
Thw. Enum. 231. Nees in DC. Prod. xi. 259. *L. nervosa*, Wight, Ic. iv. 4, 18. C. P. 1985.
Fl. B. Ind. iv. 522. Wight, Ic. t. 1620 (*L. nervosa*).

Stems 2–3 ft., straggling, divaricately branched, quadrangular, glabrous; l. numerous, 3–5 in., lanceolate or rhomboid-lanceolate, very much tapering at base and decurrent on petiole, acuminate, acute, more or less coarsely dentate, glabrous, petiole obscure; fl. in numerous, small, rounded, panicled, axillary and terminal heads, bracts and

bractlets much imbricated, about $\frac{1}{2}$ in., oblong-lanceolate, acute, ciliate, scarious, 3-nerved with transverse veinlets; sep. slightly ciliate, as long as bractlets, and outer ones quite similar to them, inner ones linear, shorter; cor. $\frac{1}{2}$ in., cor.-tube narrowed at mouth, lobes rounded; capsule $\frac{1}{4}$ in., sharply pointed.

Moist region to 4000 ft.; rather common. Fl. March, July, November; mauve-pink.

Endemic.

The heads with their large imbricated bracts are like small hops. Dries blackish.

3. **L. Walkeriana,** *Nees in DC. Prod.* xi. 260 (1847).
Thw. Enum. 231. C. P. 85.
Fl. B. Ind. iv. 522. Wight, Ic. t. 1530.

Stems 2–3 ft., branched, quadrangular, glabrous; l. $2\frac{1}{2}$–5 in., oval or rhomboid-oval, much tapering at base and decurrent on petiole, slightly acuminate, acute, coarsely crenate-serrate, glabrous above, paler and slightly hairy on veins beneath, petiole obscure; fl. as in *L. zeylanica*, but heads rather smaller, bracts and bractlets under $\frac{1}{4}$ in., glandular-pubescent; sep. more than twice as long as bractlets, lanceolate-oblong, glandular-pubescent, inner ones much narrower; cor. $\frac{3}{8}$ in., lobes spreading; capsule as in the last.

Moist region to 4000 ft.; common. Fl. Jan.; nearly white, with mauve blotches.

Endemic (?).

4. **L. fasciculata,** *Nees in Wall. Pl. As. Rar.* iii. 95 (1832).
Ruellia fasciculata, Retz. Obs. iv. 28. Nees in DC. Prod. xi. 260.
Thw. Enum. 231. C. P. 1983.
Fl. B. Ind. iv. 522. Bedd. Ic. Pl. Ind. Or. t. 228 (not good).

Stems numerous, about 1 ft., spreading, much-branched, slender, quadrangular, hairy; l. small, 1–$2\frac{1}{2}$ in., ovate-oval, rather suddenly contracted into tapering base, decurrent on petiole, subacute, irregularly dentate, hairy on both sides; fl. in small rounded heads terminating slender divaricate branches of leafy paniculate infl., bracts about $\frac{1}{4}$ in., oblong-oval, membranous, 3-veined, pubescent, glandular-ciliate, bractlets rather shorter, linear; sep. a little longer than bractlets, hairy and glandular-ciliate, inner ones narrower; cor. $\frac{3}{8}$ in., pubescent outside; capsule $\frac{1}{6}$ in., pointed.

Dry region; very common. First collected by Kœnig at the hot wells near Trincomalie. Fl. April, August.

Throughout India.

The Fl. B. Ind. says that this 'always' occurs mixed with *Hemigraphis latebrosa*, Nees; but the latter is not found in Ceylon.

21. MONOTHECIUM, *Hochst.*

Annual, l. opp., entire, fl. small, sessile, in dense unilateral spikes, bracts and bractlets acicular, many empty of flowers; sep. 5, acicular, as long as bractlets; cor. deeply 2-lipped; stam. 2, anth. 1-celled, not spurred; capsule very small, with a solid base; seeds 4, compressed, strongly rugose, retinacula large.—Sp. 2; 1 in *Fl. B. Ind.*

M. aristatum, *And. in Thw. Enum.* 234 (1860).
Anthocometes aristatus, Nees in DC. Prod. xi. 312. C. P. 1984.
Fl. B. Ind. iv. 524. Bedd. Ic. Pl. Ind. Or. t. 269 (not good).

Stem 1–2 ft., diffuse, much-branched, often rooting at lower nodes, cylindrical, slightly pubescent; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., ovate-oval, acute at both ends, entire, slightly pubescent on veins beneath, petiole $\frac{1}{2}$–1 in.; fl. crowded in short 1-sided, axillary spikes, bractlets bristle-like; sep. equal, quite like the bractlets, pubescent; cor.-tube short, lobes rounded; capsule $\frac{1}{6}$ in., sharply beaked; seeds much corrugated, white.

Low country, chiefly in the dry districts; rather rare. Dambulla; Kekirawa; Uma-oya; Hantane. Fl. March–May; white, with red dots at base of lower lip.

Also in S. India.

This is readily mistaken for *Justicia procumbens.*

22. JUSTICIA,* *L.*

Perennial herbs or shrubs, l. opp., entire or nearly so, fl. sessile, small or moderate-sized, in terminal or axillary spikes or panicles, bracts and bractlets broad or narrow, latter sometimes absent; sep. 5 (rarely 4), slightly connate at base, narrow; cor. 2-lipped, upper lip small, erect, lower lip broad, spreading, 3-lobed; stam. 2, anth. 2-celled, cells oblong, more or less distant and on different levels, the lower ones spurred at the base; style very slightly bilobed; capsule ovoid, with or without a cylindrical solid base; seeds 4, slightly compressed, tubercular or rugose, glabrous or rarely bristly.—Sp. 100; 50 in *Fl. B. Ind.*

Bracts broad, ovate, or orbicular.
Bracts $\frac{1}{2}$ in., ovate . . . . . . 1 J. BETONICA.
Bracts $\frac{1}{4}$ in., rotundate . . . . . . 2. J. ZEYLANICA.
Bracts $\frac{1}{4}$ in., spathulate . . . . . 3. J. TRANQUEBARENSIS.

* Commemorates James Justice, M.D., of Edinburgh. Name first given to a Jamaica species.

Bracts narrow, linear, or linear-lanceolate.
Erect shrub; infl. spicate, terminal . . 4. J. GENDARUSSA.
Erect shrubs, infl. paniculate, axillary.
L. linear; seeds tuberculate . . . 5. J. HOOKERIANA.
L. lanceolate; seeds bristly . . . 6. J. GLABRA.
Diffuse herbs, infl. spicate, terminal or axillary (*Rostellularia*).
Bractlets as long as sep.
L. oval or ovate-oval . . . . 7. J. PROCUMBENS.
L. oblong-linear . . . . . . 8. J. ROYENIANA.
Bractlets much shorter than sep. . . 9. J. DIFFUSA.

1. **J. Betonica,** *L. Sp. Pl.* 16 (1753). **Sudu-puruk,** *S.*
Herm. Mus. 29. Burm. Thes. 47. Fl. Zeyl. n. 18. Moon Cat. 3. Thw. Enum. 233. *Adhatoda Betonica*, Nees, l. c. 385. C. P. 1990.
Fl. B. Ind. iv. 525. Rheede, Hort. Malab. ii. t. 21.

Stem 2–4 ft., erect, cylindrical, glabrous, swollen and purple above the nodes; l. $2\frac{1}{2}$–$4\frac{1}{2}$ in., oval, tapering at base, subacute, entire or very shallowly crenate, glabrous and shining; fl. rather large, numerous in rather dense, erect, pedunculate, terminal spikes 3–6 in. long, bracts large, decussate in opp. pairs, laxly imbricated so that spike is 4-sided, nearly $\frac{1}{2}$ in., ovate, often subcordate at base, acute, minutely pubescent, white with green veins, bractlets similar but narrower; sep. much shorter than bracts, lanceolate; cor.-tube short, lower lip large, deflexed, lobes deep, oblong; capsule nearly $\frac{3}{4}$ in., ovoid, with a long solid base; seeds tubercular.

Low country up to 3000 ft. in bushy places; very common. Fl. July–October; pale violet, the lower lip darker.
Throughout India, Malaya, and Trop. Africa.
A pretty plant when in flower. Leaves used as a poultice to boils, &c.

2. **J. zeylanica,** *And. in Thw. Enum.* 233 (1860) (part).
Adhatoda zeylanica, Nees, l. c. 400. C. P. 2718 (= 2422 [part] and 713 [part]).
Fl. B. Ind. iv. 529.

Stem 2–3 ft., cylindrical, glabrous, swollen and purple above nodes; l. $2\frac{1}{2}$–3 in., oval or lanceolate, acute at base, slightly acuminate, obtuse, faintly undulate-crenate, glabrous, lineolate, thin; fl. small, few, in opp. pairs, in rather lax, peduncled, axillary spikes much shorter than l.; bracts $\frac{1}{4}$ in., rotundate, petioled, bractlets shorter, spathulate, obtuse; sep. as long as bractlets, linear, glabrous; cor. strongly 2-lipped; capsule not seen.

Var. β, **capitata,** *And. in Fl. B. Ind., l. c.* C. P. 3919.

Stem pubescent, l. larger, 3–6 in., densely and conspicuously lineolate, and sometimes with short scabrous hair above,

pubescent on veins or all over beneath; spikes short, nearly capitulate, globose, dense, bracts and bractlets larger, much imbricated, obovate, cuneate at base, densely glandular-pubescent.

Moist low country; rare. Near Ratnapura; Reigam Korale; Morowak Korale. Var. β, Singhe Raja Forest; Morowak Korale. Fl. Feb.–March, and Sept.–Oct.; white or pale pink.

Endemic.

Does not dry black as stated in Fl. B. Ind. A puzzling plant. The only form of the type I have seen would fall rather under the var. *viridescens* of the Fl. B. Ind. Var. β is probably a distinct species.

A plant from Corbet's Gap, Rangala, has been referred to this by Dr. Stapf, of Kew, but differs in having much smaller deciduous oblong-oval bracts and larger lanceolate sep. It is distinctly shrubby and dries black.

J. Moretiana, Vahl, is based on a plant collected by Hartog in Ceylon, and described and figured in Burm. Thes. 7, t. 3, f. 1. Burmann's figure is very good, and is clearly a *Justicia*, but it does not agree with any known Ceylon species (see Nees in DC. Prod. xi. 428, and Fl. B. Ind. iv. 540). The name *Moretiana* was first given in Burm. Fl. Ind. 10 from a false identification with the plant so called by Rumph. in Herb. Amboin. vi. 53, t. 23, f. 1.

3. **J. tranquebarensis,** *L. f. Suppl. Pl.* 85 (1781).
Thw. Enum. 233. C. P. 1993.
Fl. B. Ind. iv. 530. Wight, Ic. t. 462.

A low undershrub, branches numerous, divaricate, pubescent; l. 1–2 in., oval or subrotundate, subacute at base and apex, entire or very faintly crenate, much lineolate, finely pubescent beneath; fl. nearly sessile, solitary in opp. axils, bracts leaflike, broadly spathulate or orbicular on slender petiole, bractlets small, lanceolate, or 0; sep. linear-setaceous, very acute, hairy; capsule about $\frac{1}{3}$ in., with a short solid base, ovoid, glabrous; seeds densely set with ovoid sharply pointed papillæ.

Dry region; rather rare. Trincomalie; Jaffna; Dambulla. Fl. March; pale reddish-purple.

Also in S. India.

J. Gendarussa,* *Burm. f. Fl. Ind.* 10 (1768). **Kalu-waraniya,** *S.* **Karunochchi,** *T.*

J. Gandarussa, L. f. Suppl. Pl. 85. Moon Cat. 3. Thw. Enum. 233. C. P. 3662.

Fl. B. Ind. iv. 532. Wight, Ic. t. 468 (*Gendarussa vulgaris*). Bot. Reg. t. 635.

A much-branched undershrub, stems quadrangular, thickened above nodes, glabrous, purple; l. 3–5 in., linear-lanceolate, acute at base, tapering to obtuse apex, entire or

---

* The Malayan name as given by Rumph.

slightly and irregularly crenate, glabrous and shining, rather thick, veins prominent beneath, purple, petiole about $\frac{1}{4}$ in.; fl. rather small, in opp. clusters of 3, in short, interrupted, sessile, terminal spikes; bracts linear, acute, bractlets 0; sep. linear-subulate, glabrous; cor.-tube $\frac{3}{8}$ in., upper lip notched, lower lip transversely rugose; fruit not seen.

Low country; rather common, but usually, if not always, due to cultivation. Fl. August, Sept.; white or pink, with minute red dots in the throat and lip.

Throughout India, Malaya, and China, wild or cultivated.

Ripe capsules are rarely, if ever, produced. The leaves have a pleasant taste; a decoction of them is a remedy for bowel complaints.

5. **J. Hookeriana,** *And. in Thw. Enum.* 233 (1860).

Leptostachya zeylanica, Nees, l. c. 379. *Adhatoda Hookeriana*, Nees, l. c. 403. C. P. 701.

Fl. B. Ind. iv. 532. Bedd. Ic. t. 268.

A much-branched twiggy undershrub, stems sub-quadrangular, becoming cylindrical, thickened at nodes, glabrous; l. very numerous, closely placed, $1\frac{1}{2}$–4 in., linear or lanceolate-linear, tapering to both ends, obtuse or acute, entire or very faintly crenate, glabrous, petiole obscure; fl. in lax axillary panicles about as long as l., bracts and bractlets equal, oblong-linear; sep. linear, much longer than bractlets, acute, glabrous; cor.-tube $\frac{1}{4}$ in., upper lip 2-toothed, lobes of lower lip truncate, erose; anth. exserted, spurs short; capsule $\frac{3}{8}$ in., slightly clavate, acute; seeds finely tuberculate.

Sides of streams in moist low country below 2000 ft.; rather common. Pasdun Korale; Sabaragamuwa; Ambagamuwa; Hantane. Fl. March, Sept.; white, with purplish-pink dots on lower lip.

Endemic.

6. **J. glabra,** *Koen. in Roxb. Hort. Beng.* 4 (1814).

Thw. Enum. 234. Nees in Journ. Linn. Soc. ix. 516. C. P. 3663 (= 713 part), 3110 (= 2422 part).

Fl. B. Ind. iv. 535. Wight, Ic. t. 1554.

Semi-shrubby, branches long, erect, cylindrical, thickened above nodes, glabrous; l. numerous, 3–4 in., lanceolate or ovate-lanceolate, much tapering to base, acuminate, acute or subacute, faintly crenate, glabrous, lineolate, petiole obscure but sometimes $\frac{1}{2}$ in.; fl. usually 2 or 3 together, on slender ped., in small very lax axillary panicles with divaricate branches, bracts and bractlets small, linear, inconspicuous; sep. linear, very acute, puberulous; upper lip of cor. entire, lobes of lower lip acute; anth.-spurs long; capsule over $\frac{1}{2}$ in., clavate, pubescent, the lower half solid and stalk-like; seeds densely covered with yellow bristles, retinacula large, strong, hooked.

Moist and intermediate regions up to 4000 ft.; rather common. Nillowe Kande; Ambagamuwa; Dolosbagie; Hunasgiriya; Hanguranketa; Lunugala, Uva. Fl. Jan.–April; cream-coloured with red dots or lines in the throat.

Also in S. India.

This species is mixed up with *J. zeylanica* in Thw. Enum., and the C. P. numbers are confused in Herb. Perad. It is possible that two different species are still combined here, as there is considerable difference in the size of the bractlets in different specimens.

7. **J. procumbens,** *L. Sp. Pl.* 16 (1753). **Mayani,** *S.*

Herm. Mus. 2. Burm. Thes. 194. Fl. Zeyl. n. 19. Moon Cat. 3. *Rostellularia procumbens*, Nees in DC. Prod. xi. 371 (part). *R. Royeniana*, Thw. Enum. 234 (part). And. in Journ. Linn. Soc. ix. 511. C. P. 142, 2904 (part).

Fl. B. Ind. iv. 539.

Stems diffuse, slender, with many divaricate branches, rooting at lower nodes, furrowed, nearly glabrous, with a few long hairs below the nodes or with spreading hair; l. $\frac{3}{4}$–$1\frac{1}{2}$ in., oval or ovate-oval, obtuse at both ends, entire or slightly crenate, softly hairy-pubescent on both sides, petiole $\frac{1}{8}$–$\frac{1}{2}$ in.; fl. very small, in rather dense, cylindrical, terminal spikes $\frac{1}{2}$–$1\frac{1}{2}$ in. long, bractlets linear, long-ciliate; sep. linear-filiform, strongly ciliate, as long as bractlets, 1 shorter or absent; lower lip of cor. broader than long, lobes shallow, obtuse; capsule $\frac{1}{6}$ in., with a short, solid base.

Var. β, **latispica,** *Clarke.* Wight, Ic. t. 1539 (*Rostellularia procumbens*). C. P. 142 part (= 228).

Much stouter; l. larger, thicker, often glabrous, spikes thicker, bracts longer, more strongly ciliate; fl. much larger.

Moist region from sea-level up to 7000 ft., among grass, especially in the montane zone; very common. Var. β only in montane zone. Fl. Oct.–March; pale violet pink, the lower lip spotted with darker pink.

Also in S. India, Malaya, Australia.

The flowers vary in size, being larger in the hill forms. The native name given for this by Hermann is 'Hulunajikola.'

8. **J. Royeniana,** *Clarke in Fl. B. Ind.* iv. 537 (1885).

Rostellularia Royeniana,* Nees, l. c. 373; Thw. Enum. 234 (part). C. P. 2904 part (= 404).

Fl. B. Ind. iv. 537.

Stems numerous, spreading or procumbent from a small woody rootstock, much branched, furrowed, glabrous or slightly rough; l. 1–2 in., shortly petioled or nearly sessile,

---

* Commemorates A. van Royen, Professor of Botany in Leyden University in the middle of the eighteenth century, from whose herbarium the specimen described by Nees was obtained. It was, doubtless, from Hermann, many of whose specimens found their way into that collection.

oblong-linear, acute at base, obtuse, margins often reflexed, glabrous, and very coarsely lineolate (so as to appear wrinkled when dried) above, often slightly hairy on veins beneath; spikes rather lax, usually interrupted below, 1–2½ in., longer than peduncles, terminal rarely axillary, bractlets linear, ciliate with long hair; sep. 5, similar to bractlets; lower lip of cor. nearly orbicular, lobes very short; capsule ⅙ in., oblong-ovoid, blunt, glabrous.

Montane zone, 3000–6000 ft.; rather common. Ambagamuwa; Adam's Peak; Palugama, Uva. Fl. Nov.–Feb.; bright pink.
Endemic.

9. **J. diffusa,** *Willd. Sp. Pl.* i. 87 (1797).
Rostellularia diffusa, Nees, Thw. Enum. 234. C. P. 1976.
Fl. B. Ind. iv. 538.

Stems woody below, much branched, sub-quadrangular, glabrous; l. 1–1¾ in., ovate-oval, acute at both ends, glabrous, strongly lineolate, petiole ¼–⅜ in.; spikes 1–2 in., very slender and narrow, lax, much interrupted, terminal and axillary, bractlets lanceolate, acute, glabrous; sep. much longer than bractlets, linear-lanceolate, very acute, nearly glabrous; cor. very small; capsule ⅙ in., acute, with a very short, solid base; seeds slightly rugose.

Var. β, **prostrata,** *Roxb. in Fl. B. Ind. l. c.*

Stems prostrate, depressed; l. much smaller, ¼ in. or less, broadly oval or suborbicular, spikes shorter and more dense, bractlets and sep. broader, with membranous margins; capsule smaller, ⅛ in.

Dry region; rather rare. Trincomalie; Batticaloa; Venloos Bay; Bintenne. Var. β, Kalpitiya; near Kankesanturai. Fl. July–Dec.; pink.
Also in India, Burma, and Siam.
Var. β, growing in very arid exposed rocky places, is often very dwarf, prostrate, woody, and intricately branched.

23. ADHATODA,* *Nees.*

Differs from *Justicia* only in the lower cell of anth. being pointed but not spurred. The 2 genera would be better combined.—Sp. 6; 2 in *Fl. B. Ind.*

***A. Vasica,**† *Nees in Wall. Pl. As. Rar.* iii. 103 (1832). **Agaladara, Wanepala,** *S.* **Ádátódai, Pavettai,** *T.*

Herm. Hort. Acad. Lugd.-Bat. 642; Mus. 23. Burm. Thes. 6. Fl. Zeyl. n. 16. *Justicia Adhatoda*, L. Sp. Pl. 15. Moon Cat. 3. Thw. Enum. 233. C. P. 1991.
Fl. B. Ind. iv. 540. Herm. Hort. Acad. Lugd.-Bat. t. 643. Bot. Mag. t. 861.

---

* The Tamil name scarcely altered.
† *Vasica*, from Vasaka, the Sanskrit name.

A shrub, 3–6 ft., with many long opp. ascending branches, bark yellowish, stems cylindrical, glabrous, young parts finely puberulous; l. large, 6–12 in., lanceolate, tapering to base, acuminate, subacute, very faintly crenate, quite glabrous (minutely puberulous when young), dark green, paler beneath, venation reticulate, copious, pellucid, petiole 1–1½ in.; fl. large, in short dense axillary spikes, on long stout peduncles shorter than l., bracts ¾–1 in., oval, subacute, glabrous, erect, imbricated, bractlets ½–⅝ in., oblong-lanceolate, acute; sep. ⅜ in., slightly connate at base, oblong-lanceolate, acute, finely woolly-pubescent, posterior one rather shorter; cor. pubescent outside, tube ½ in., lower part cylindrical, above laterally dilated and inflated, upper lip ¾ in., oblong-oval, curved, obtuse, notched, lower lip as long, lobes very deep oblong rounded; disk annular; fil. long, curved; capsule '¾ in., clavate, pubescent; seeds glabrous, tubercular-verrucose.'

Low country; common in hedges and waste places, especially in dry region, but usually planted, and scarcely a native. Fl. Dec.; white with pink veins, anth. green.

Also in India, Malaya, &c., wild or cultivated.

Much cultivated by the natives as a fence. Largely grown about Jaffna as a green manure for Tobacco-gardens. The Tamil name means that goats will not touch it. The juice of the leaves, also the flowers and bark, are used medicinally in children's coughs; the leaves are bitter, but have no scent when bruised. Hermann states that the bark was used to procure abortion, whence his name *Ecbolium*. The name 'Malabar-nut' is applied to this by the English in India—a name I never heard here.

24. **RHINACANTHUS,** *Nees.*

Small undershrub, l. opp., entire; fl. rather large, in very lax, divaricate panicle, bracts and bractlets very small; sep. 5, equal, narrow; cor.-tube very long and narrow, upper lip very narrow, bifid, lower broad, 3-lobed; stam. 2, inserted in throat of cor.-tube, 2-celled, cells superposed, blunt at base; capsule clavate, with a long, solid base; seeds 4, ovoid, glabrous, retinacula large, much hooked—Sp. 4; 2 in *Fl. B. Ind.*

R. communis, *Nees in Wall. Pl. As. Rar.* iii. 109 (1832). **Anitta,** *S.* **Nagamulli,** *T.*

Justicia nasuta, L., Moon Cat. 3. Thw. Enum. 234. C. P. 1982. Fl. B. Ind. iv. 540. Wight, Ic. t. 464.

Slender, stem 2–4 ft., slightly branched, nearly cylindrical, slightly rough; l. 2–3 in., lanceolate, tapering to base, acute, entire, glabrous, copiously lineolate, petiole obscure; fl. sessile or shortly pedicellate, solitary or 2 or 3 together, distantly placed on divaricate branches of very large, lax, pubescent, terminal panicle, bracts linear-lanceolate, acute; sep. linear,

pubescent; cor.-tube ¾ in., cylindrical, pubescent outside, lower lip ½ in., lobes oblong, obtuse; capsule over ½ in., pointed, glabrous.

Roadsides, edges of jungles, &c., in dry region; very common. Fl. January, July–October; white.

Throughout India, Java, Madagascar, &c., cultivated or wild.

This is never cultivated in Ceylon so far as I know. A decoction of the leaves and root-bark is a general external remedy for various skin diseases.

[*Dianthera dichotoma*, Clarke (*Justicia dichotoma*, Bl.).—This is given in Fl. B. Ind. iv. 543, on the faith of Anderson's reference to it (in Journ. Linn. Soc. ix. 516) of the C. P. numbers which he had previously (in Thw. Enum.) rightly determined as *J. zeylanica* and *J. glabra.* The plant is a native of Java and the Philippine Is., and has no claim to a place in our flora.]

25. **PTYSSIGLOTTIS,** *And.*

Perennial prostrate herb, l. opp., entire; fl. moderate-sized, few, solitary or 2–4 together, terminal, bracts and bractlets small, several empty; sep. 5, equal, very narrow; cor.-tube short, campanulate, upper lip deeply 2-lobed, lower broad, 3-lobed; stam. 2, anth. 2-celled, cells parallel, not spurred; capsule clavate, with a long, solid base; seeds 4, much compressed, scaly-tubercular, retinacula large.—Monotypic and endemic.

P. radicosa, *And. in Thw. Enum.* 235 (1860).
Rhytiglossa radicosa, Nees in DC. Prod. xi. 344. C. P. 3538.
Fl. B. Ind. iv. 544. Bedd. Ic. Pl. Ind. Or. t. 267.

Stems procumbent, slender, with long roots from the nodes, short, slightly branched, cylindrical, pubescent; l. ¾–1½ in., on short petioles, oval, acute or rounded at base, obtuse, entire, pubescent, with white adpressed hair above, glabrous beneath; fl. usually solitary, on a short peduncle which often bears several empty bracts and occasionally 1–3 more fl., bracts and bractlets linear, sharply acuminate; sep. very acute, puberulous; cor. ¼ in., pubescent outside; seeds oblong-ovoid, yellow.

Moist low country; rare. Kolona Korale; wet places on rocks, Morowak Korale. Fl. Sept.–Feb.; white.

Endemic.

First collected by Champion.

26. **ECBOLIUM,*** *Medik.* (non *Riv.*).

Shrub, l. opp., entire or nearly so; fl. large, in terminal

---

* A name, alluding to its medicinal qualities, applied by Rivinus (following Hermann) to *Adhatoda Vasica* (q. v.), but transferred by Linnæus to the present species.

spikes, bracts very large, imbricate, decussate, bractlets minute; sep. 5, very small, equal, narrow; cor.-tube very long, filiform, cylindrical, upper lip narrowly linear, bifid, lower lip large, deeply 3-lobed, the middle one the broadest; stam. 2, inserted in cor.-throat, anth. 2-celled, cells parallel, one rather higher than the other, not spurred; style very long and slender, stigma bifid; capsule with a long, solid base, upper portion ovoid, acute, much compressed; seeds 2 (rarely 4?), large, ovate, very flat, scabrous, retinacula very large, curved.—Sp. 2; 1 in *Fl. B. Ind.*

E. Linneanum, *Kurz in Journ. As. Soc. Beng.* xl. pt. 2, 75 (1871).
Herm. Mus. 33. Burm. Thes. 7. Fl. Zeyl. n. 17. *Justicia Ecbolium*, L. Sp. Pl. 15; Moon Cat. 3. *Eranthemum Ecbolium*, And. in Thw. Enum. 235. C. P. 1978.
Fl. B. Ind. iv. 544. Burm. Thes. t. 4, f. 1. Wight, Ic. t. 463.

A low shrub, branches erect, cylindrical, thickened above the nodes, glabrous; l. large, 4½–6 in., oblong-oval or lanceolate, tapering to base, acuminate, acute, entire or very faintly crenate, glabrous, shining and dark green above, paler and densely finely pubescent beneath, petiole obscure; fl. large, sessile, in opp. pairs, spikes nearly sessile, 2–10 in., 4-sided, bracts ¾–⅞ in., oblong-oval, aristate, glandular-puberulous, ciliate, semi-membranous, reticulate-veined, bractlets subulate; sep. linear, acuminate, glandular-pubescent; cor.-tube 1½ in., slightly dilated and laterally compressed at throat, deflexed-hairy outside, upper lip about ½ in., very narrow, strongly reflexed, lower lip about 1½ in. diam., lat. lobes oblong, acute, middle one oval, obtuse; capsule pubescent; seeds white.

Low country, especially in the dry region; common. Fl. Feb., March, and July, August; pale livid bluish-green.

Also in India and Burma, Arabia, Abyssinia, and Madagascar.

Varies in width of leaves and length of spikes; the Fl. B. Ind. gives a var. *lætevirens* for Ceylon, and this seems to be our commonest form.

Graptophyllum hortense, Nees (*Justicia picta*, L.) is very common in gardens, where it goes by the name of 'Caricature plant,' from the fancied profiles in the variegated leaves. It is well figured in Bot. Reg. t. 1227.

27. **RUNGIA,** *Nees.*

Annual or perennial herbs, l. opp., entire, fl. small, sessile in terminal or axillary often 1-sided spikes, bracts imbricated in 4 ranks (2 ranks empty of fl.) more or less margined with scarious wings or borders, bractlets smaller; sep. 5, very narrow; cor. 2-lipped, upper lip acute or emarginate, lower

rounded, very shortly 3-lobed; stam. 2, anth. 2-celled, cells at different levels, lower one spurred; capsule small, without a solid base, placentas separating from below upwards, carrying with them the seeds; seeds 4, orbicular, compressed, rugose or worted.—Sp. 20; 16 in *Fl. B. Ind.*

Spikes flattened, 1-sided.
  Spikes over ½ in., bracts broadly winged . . . 1. R. LATIOR.
  Spikes ¼ in., bracts narrowly margined . . . 2. R. PARVIFLORA.
Spikes 4-sided.
  Bracts obtuse, very broadly winged . . . 3. R. REPENS.
  Bracts acuminate, very narrowly margined . . 4. R. APICULATA.

1. **R. latior,** *Nees in DC. Prod.* xi. 472 (1847).
R. longifolia, Thw. Enum. 238 (part) (? Nees). C. P. 89 (3355).
Fl. B. Ind. vi. 547 (*R. longifolia*, var. *latifolia*). Wight, Ic. t. 1548.

Stems rather long, straggling, branched, thickened above nodes, glabrous but for two narrow lines of pubescence; l. 2–4 in., lanceolate, tapering to base, acuminate, obtuse, glabrous or pubescent on veins beneath, sparingly lineolate, petiole ¼–½ in., spikes short, ½–1 in., pedunculate, terminal and from upper l.-axils, flat and one-sided; empty bracts oblong-lanceolate, over ¼ in., acute, minutely apiculate, with rather scarious borders, ciliate, finely pubescent, floral bracts and bractlets nearly equal, oblong-oval or slightly obovate, obtuse, often slightly emarginate, broadly bordered, finely ciliate; sep. linear, very acute, chaffy; cor. exserted.

Montane zone up to 7000 ft.; rather common. Fl. Nov.–April; white with blue lines on lip.

Also in the Nilgiris, &c., S. India.

This is referred in Thw. Enum. and Fl. B. Ind. to *R. longifolia*, Nees and Arn. l. c. 471, which was based partially on Ceylon specimens from Walker. I do not recognise this species from the descriptions given. *R. latior* is not given for Ceylon in Fl. B. Ind., but Wight's figure represents our plant very well, save in being more pubescent.

2. **R. parviflora,** *Nees in Wall. Pl. As. Rar.* iii. 110 (1832).
Nees in DC. Prod. xi. 469. Thw. Enum. 234. C. P. 1975 (257).
Fl. B. Ind. iv. 550. Bedd. Ic. Pl. Ind. Or. t. 266 (*R. longifolia*) (good).

Annual, stems erect, slender, with opposite lines of pubescence, divaricately branched; upper l. 2½–4 in., linear, much tapering to base, obtuse, slightly undulate, glabrous, lineolate, petiole obscure, lower l. oval or rotundate, distinctly petioled; spikes very short, about ¼ in., flat, ranks of empty bracts in one plane, ¼ in., linear-oblong, mucronate, with a very narrow margin, glabrous, slightly ciliate, floral bracts about ⅛ in., oval, obtuse, shortly mucronate with the scarious

margin wider, glabrous, ciliate, bractlets narrower than bracts; sep. linear-lanceolate; cor. small.

Var. β, **pectinata,** *Clarke, l. c.* *Justicia pectinata*, L., Moon Cat. 3. *R. pectinata*, Nees, l. c. 470; And. in Journ. Linn. Soc. ix. 517. C. P. 1975 (= 3354, 3357). Wight, Ic. t. 1547.

Perennial (?), straggling and semi-scandent by numerous divaricate branches; l. smaller, lanceolate, acuminate, subacute, with a few short bristly hairs above and more beneath; spikes generally in threes, very lax; cor. larger, nearly ½ in.

Moist region up to 7000 ft.; common. Var. β much the commoner. Fl. March, April; white with blue lines on lower lip.

Throughout India and Burma.

Nees quotes Burmann in Herb. Vahl for *R. pectinata* in Ceylon, and Linnæus's specimens were probably also from that source. It is possibly a distinct species.

3. **R. repens,** *Nees in Wall. Pl. As. Rar.* iii. 110 (1847). **Sulunayi,** *S.*
Herm. Mus. 21. Burm. Thes. 7, 194. Fl. Zeyl. n. 20. *Justicia repens*, L. Sp. Pl. 15. Moon Cat. 3. Thw. Enum. 235. C. P. 1972, 2935.
Fl. B. Ind. iv. 549. Burm. Thes. t. 3, f. 2. Wight, Ic. t. 465.

Stems usually decumbent and rooting at the base, then erect, slender, cylindrical, puberulous; l. oblong- or lanceolate-linear, 1–2 in., on very short petiole, acute at base, subacute at apex, entire, glabrous, densely lineolate above (so as to be rough when dried); spikes long, 1½–5 in., 4-sided, erect, terminal, bracts much imbricated, all similar, nearly ¼ in., broadly oval, obtuse, sharply mucronate, pubescent, very slightly ciliate, broadly bordered with white scarious margin, bractlets linear-lanceolate, acute; sep. linear, pubescent, very acute; capsule ⅙ in., oblong-ovoid, pubescent; seeds with concentric furrows.

Dry region; common. Fl. Sept.–March; violet with red dots in the throat.

Also throughout India.

The bracts in our plant are usually pubescent. C. P. 2935 is a remarkable form from Bintenne, with ovate-lanceolate, strongly lineolate leaves, much broader and shorter spikes, and a more spreading habit; the bracts are much larger and more strongly mucronate, hairy, and ciliate.

4. **R. apiculata,** *Bedd. Ic. Pl. Ind. Or.* 60 (1874).
R. repens (part), Thw. Enum. 235. C. P. 1973.
Fl. B. Ind. iv. 548. Bedd. Ic. Pl. Ind. Or. t. 247.

Stems slender, much-branched, finely pubescent; l. 1–2 in., on very short ped., acute at base, obtuse, from oval to linear-lanceolate, glabrous or very slightly pubescent on veins

beneath; spikes numerous, slender, 1–1¼ in., erect, 4-sided, bracts nearly similar, ¼ in., oval, acuminate, stiff, mucronate, puberulous, with a very narrow membranous wing, the floral ones narrower and with rather wider wing, bractlets very narrow, subulate; sep. filiform, a little longer than bractlets.

Lower montane zone; rare. Ambagamuwa and Pusselawe (Gardner). Also in S. India.

I have seen only Gardner's specimens.

28. **DICLIPTERA,** *Juss.*

Herbaceous, l. opp., entire, fl. moderate-sized, sessile, 2 or 3 together (1 or 2 usually abortive) enclosed in a pair of large bracts, arranged in umbellate axillary cymes; bractlets linear, small; sep. 5, connate below, somewhat unequal, longer than bractlets; cor.-tube rather long, somewhat dilated above, limb deeply 2-lipped, upper lip entire, lower shortly 3-lobed; stam. 2, anth. 2-celled, cells superposed, not spurred; stigma bifid; capsule with a short, solid base, placentas separating from the base; seeds 4, ovoid, compressed, worted, retinacula large, straight.—Sp. 60; 11 in *Fl. B. Ind.*

D. zeylanica, *Nees in DC. Prod.* ix. 474 (1847).
D. bivalvis, Thw. Enum. 235 (non Juss.). C. P. 2576, 399.
Fl. B. Ind. iv. 552. Wight, Ic. t. 1551 (*D. bivalvis*).

Stems long, semi-scandent, much-branched, cylindrical, glabrous or with opp. lines of pubescence; l. 1–2½ in., ovate-oval, acute at base, shortly acuminate, subacute, entire, glabrous or slightly rough and copiously lineolate above, paler and pilose on veins beneath, petiole ½ in.; bracts oval, very unequal, mucronate, ciliate, somewhat hairy, veined, cymes on longish peduncles, bractlets pubescent; anth. small; style long, pubescent; capsule ⅓ in., clavate, pubescent.

Var. β, **Neesii,** *Trim.* C. P. 399.

Much smaller, stems diffuse, prostrate, much rooting at nodes, slender, pubescent; l. smaller, bracts smaller, rotundate, more pubescent, with a longer mucro.

Shady places up to 4000 ft.; rare, chiefly in the intermediate districts. Hunasgiriya; Uda Pusselawe; Haputale. Var. β, Uma-oya. Fl. Feb., May, Aug.; bright pink, with the base of the upper lip white.

Also in S. India.

Thwaites considered var. β to be the plant intended by Nees, our ordinary form coming rather under his *D. bivalvis*.

[*Peristrophe tinctoria*, Nees, is given for Ceylon by Anderson in Thw. Enum. 234 on the faith of a specimen from Walker in Herb. Kew. It was probably cultivated here. This locality is not given in Fl. B. Ind., but another species, *P. montana*, Nees, is entered there (iv. 556) 'Ceylon frequent,' I know not on what authority. This latter is a handsome plant of S. India, figured in Wight, Ic. t. 1553, and may also have been cultivated here.]

XCIX.—VERBENACEÆ.

HERBS, shrubs, or trees, l. opp. (rarely ternate), simple or compound, without stip.; fl. usually rather small, bisexual, regular or irregular, in heads, spikes, or cymes; cal. with 4 or 5 (in *Lippia* 2) segm., or 2-lipped, persistent; cor.-tube long or short, lobes 4 or 5, nearly equal or in 2 lips; stam. 4, didynamous, rarely 2; ov. superior, 2-celled, with usually 2 (sometimes 1) ovules in each cell (rarely 4-celled with 1 ovule in each cell); fruit dry or succulent, drupaceous or capsular and 4-valved (2-valved in *Avicennia*), drupe with one 4-celled or two 2-celled or four 1-celled pyrenes (in *Avicennia* seed solitary).

Infl. centripetal.	
Infl. capitate.	
Cor.-lobes 4; fruit succulent	1. LANTANA.
Cor. 2-lipped, lobes 5; fruit dry . . .	2. LIPPIA.
Infl. spicate.	
Pyrenes 1-seeded.	
Stam. 4	3. BOUCHEA.
Stam. 2	4. STACHYTARPHETA.
Pyrenes 2-seeded	5. PRIVA.
Infl. centrifugal (cymose).	
Fruit a drupe (rarely subcapsular in 10).	
Cor. regular, lobes 4 (see also in 7) . .	6. CALLICARPA.
Cor. more or less 2-lipped, lobes 4 or 5.	
Pyrene solitary, normally 4-celled.	
L. simple.	
Fl. very small	7. PREMNA.
Fl. large, yellow	8. GMELINA.
L. compound	9. VITEX.
Pyrenes 4	10. CLERODENDRON.
Fruit a 4-valved capsule	11. GLOSSOCARYA.
Fruit indehiscent, dry	12. SYMPHOREMA.
Fruit a fleshy 2-valved capsule	13. AVICENNIA.

We have 26 species, nearly all low-country plants, and especially found in the dry region, to which 11 are entirely confined, whilst only 2 are restricted to the moist country; 7 species extend into the lower montane zone. *Glossocarya* and 3 species of *Premna* seem to be endemic.

1. LANTANA, *L.*

Shrub, l. ternate or opp., fl. small, in dense axillary heads, bracts large, cal. very small, truncate; cor.-tube slender, cylindrical, lobes 4, nearly equal; stam. 4, didynamous, inserted and included in tube; ov. 2-celled, with 1 ovule in each cell, style short; drupe berry-like, with 2 bony 1-seeded pyrenes.—Sp. 40; 3 in *Fl. B. Ind.*

L. indica, *Roxb. Hort. Beng.* 46 (1814).
L. alba, Thw. Enum. 242 (non Mill.). C. P. 498.
Fl. B. Ind. iv. 562. Wight, Ic. t. 1464.

Small shrub, branches quadrangular, hispid-hairy, yellowish-brown; l. $1\frac{1}{2}$–2 in., ovate, usually in whorls of 3, rounded but suddenly narrowed at base, subacute, crenate-serrate, finely pubescent above, densely and softly white-pubescent beneath; fl. sessile, heads small, rounded, pedunculate, lengthening out in fruit into short spikes, bracts large, ovate, acute, hairy, peduncles about 1 in., bristly-hairy; cal. membranous, truncate, hairy, ciliate; cor. hairy outside, tube $\frac{1}{4}$ in., limb flat, spreading, lower lobes rather longest; fil. very short; drupe $\frac{1}{6}$ in., pale purplish-pink.

Lower montane zone; very rare. I have only seen the C. P. specimens which were collected by Gardner at Galagama. Fl. April; 'pale purple' (Thwaites).

Throughout India, Beluchistan, Trop. Africa.

L. trifolia, L., occurs as a roadside weed, and is extremely common in some parts of Uva, as near Badulla. The flowers are a pale violet-pink (rarely white), and the fruit, which is in dense, narrow, erect spikes, is of much the same tint, but duller. It is a native of Trop. America.

L. aculeata, L.—Probably the most familiar plant in the moist region of Ceylon is 'the Lantana,' a Tropical American shrub long cultivated in English hothouses, and introduced as an ornamental plant to Ceylon soon after 1824.* It spread as a weed over the country with extraordinary rapidity, and throughout the moist low country now occupies open ground, especially such as has gone out of cultivation, often to the exclusion of all other plants. Its area is still spreading, but it has difficulty in maintaining itself above about 3500 ft., and also in the 'intermediate' low country, where it dies out before reaching the dry region, though there is a colony at Jaffna. Shade ultimately kills it, but it has the power of scrambling up the branches of low trees and so reaching the light. Its rapid diffusion has been much helped by birds, which are fond of the berries (see Thwaites, Enum., Preface, vii., and in the German periodical, 'Flora,' for 1872, p. 142). It has obtained a similar footing in other Tropical parts of the Old World, as in S. India and Mauritius.

With regard to the right name for this abundant weed, *L. mixta*, L.,

* It is said, by Sir Hudson Low, who held a military command here in 1826.

is adopted by Thwaites, and *L. Camara*, L., in Fl. B. Ind. iv., 562; but our plant is always prickly, and is well represented in the figure quoted by Linnæus for his *L. aculeata* (Plukenet Phyt. t. 233, f. 5) made from a plant then (1696) in cultivation at Hampton Court. The Sinhalese call the plant *Rata-hinguru* and *Gandapana* (the latter transferred from *Mappia ovata*, but the *Lantana* has a pleasanter scent than that plant).

2. **LIPPIA,** *L.*

Herbaceous, widely creeping, l. small, opp., serrate, fl. very small, in dense long-stalked axillary heads; cal. of 2 almost distinct segm.; cor.-tube short, wide, limb 2-lipped, upper lip 2-, lower 3-lobed, with the middle lobe the largest; stam. 4, didynamous; fruit minute, globose, dry, splitting into 2 1-seeded pyrenes.—Sp. 90; 2 in *Fl. B. Ind.*

L. nodiflora, *Rich. in Mich. Fl. Bor.-Amer.* ii. 15 (1803). **Herimena-detta,** *S.* **Podutalai,** *T.*

Herm. Mus. 56. Fl. Zeyl. n. 399. *Verbena nodiflora*, L. Sp. Pl. 20. Thw. Enum. 241. C. P. 1947.
Fl. B. Ind. iv. 563. Wight, Ic. t. 1463.

Stems prostrate, rooting at the nodes, much-branched, subquadrangular, glabrous; l. numerous, small, $\frac{3}{4}$–$1\frac{1}{4}$ in., spathulate, cuneate at base, obtuse, deeply and sharply serrate in upper part, rather thick, glabrous, minutely punctate, petiole short, obscure; fl. sessile, densely packed, heads at first nearly globose, but becoming spicate and oblong in fruit, peduncles 1–3 in. from axil of one only of each pair of l., bracts ovate, acute or subacute; cor.-limb scarcely $\frac{1}{10}$ in. diam., lobes spreading, rounded; fil. and style very short; fruit about $\frac{1}{16}$ in.

Sands of the seacoast, also margins of tanks in the dry region; very common. Fl. all the year; very pale violet-pink.
In all Tropical and warm temperate countries.
The leaves are used in native medicine.

3. **BOUCHEA,** *Cham.*

Herb, woody at base, l. opp., coarsely serrate, fl. rather large, sessile, on (but not sunk in the axis of) long dense spikes, bracts small, linear; cal. tubular, narrowly cylindrical very strongly 5-ribbed, split down one side in fruit, segm. 5, long, bristle-like; cor.-tube slender, lobes 5, large, the lowest one the broadest; stam. 4, didynamous, included; fruit enclosed in cal., dry, linear-oblong, splitting into 2 1-seeded pyrenes.—Sp. 16; 2 in *Fl. B. Ind.*

B. hyderabadensis, *Walp. Rep.* iv. 12 (1844).
Thw. Enum. 241. C. P. 3574.
Fl. B. Ind. iv. 564. Wight, Ic. t. 1462.

Semi-shrubby herb, branches sub-quadrangular, glabrous; l. 3–4 in., lanceolate or ovate-lanceolate, tapering at base, acute, deeply serrate, glabrous above, pubescent on veins beneath, petiole ½–1 in.; fl. crowded and imbricated on stout terminal spikes 4–12 in. long, bracts linear, ⅞ in., slightly hairy; cal. ½ in., ribs and segm. with hispid hairs; cor.-tube ½ in., lobes flat, spreading, obtuse; fruit ⅜ in.

Open places in intermediate or dry country; very rare. Only found on a patana between Medamahanuwara and Alutnuwara in 1858 by Thwaites. Fl. Feb.; bright pink.

Also in Peninsular India.

4. STACHYTARPHETA, *Vahl.*

Annual, l. opp., serrate, fl. small, sunk in the axis of very long terminal spikes; cal. tubular, flattened, with 4 acute teeth; cor.-tube narrow, cylindrical, limb nearly as long as tube, lobes 5, somewhat unequal, rounded, flat, spreading; stam. 2, included in tube; fruit very small, enclosed in cal., oblong, dry, splitting into 2 1-seeded pyrenes.—Sp. 40; 1 in *Fl. B. Ind.*

***S. indica,** *Vahl, Enum.* i. 206 (1805). **Bala-nakuta,** *S.* **Nai-oringi,** *T.*
Verbena indica, L. Syst. Nat. x. Thw. Enum. 241. C. P. 3153.
Fl. B. Ind. iv. 564. Bot. Mag. t. 1848 (*S. urticæfolia*).

Stems 1–3 ft., erect, dichotomously branched, young shoots slightly quadrangular, puberulous; l. 3–4 in., sessile or nearly so, broadly oval but much tapering to base, acute, coarsely serrate, glabrous or nearly so, venation reticulate, depressed above, prominent beneath; fl. small, numerous, sessile, closely arranged in long narrow terminal spikes, and each sunk in a separate cavity of the axis, bracts small, adpressed, acuminate, spikes stiff, curved, cylindrical, ultimately 10–15 in.; cal. ¼ in., segm. short, acute; cor.-tube ½ in., slightly curved; limb ⅜–½ in. diam.; style persistent; fruit ⅙ in.

Var. β, **jamaicensis.** *S. jamaicensis*, Vahl. Bot. Mag. t. 1860.

Leaves oblong-oval, with fewer and larger serrations, entire at the base and tapering more gradually into petiole, thicker in texture, and of a paler green, less veined; flowers rather paler in colour.

Roadsides and wet places; very common weed. Fl. all the year; bright blue-purple.

Throughout Trop. Asia and America.

This is probably originally an introduction here from America. Linnæus received it from Ceylon from Van Royen, and the specimens were, no doubt, collected by Hermann; but there are none in his own herbarium. The two varieties are quite easily recognised, though the characters are but slight. The Bot. Mag. figures are good. The flowers are sometimes white.

Mr. W. Ferguson sent me in 1884 from Galboda, Ambagamuwa, a singular plant, obviously a natural hybrid between this and *S. mutabilis*, Vahl, a pink-flowered species often cultivated in gardens.

5. **PRIVA,** *Adans.*

Perennial herb, l. opp., toothed, fl. small, nearly sessile, in very lax, slender, terminal spikes; cal. tubular, becoming inflated with fruit, covered with short hooked hairs, segm. 5, short, toothlike; cor.-tube slender, lobes 5, short, nearly equal, rounded; stam. 4, didynamous, included; ov. 2-celled with 2 ovules in each cell, style long, persistent; fruit enclosed in enlarged cal., dry, readily splitting into two 2-seeded pyrenes, which are spinous on the back and have a large hollow cavity on the ventral side.—Sp. 9; 1 in *Fl. B. Ind.*

P. leptostachya, *Juss. in Ann. Mus.* vii. 70 (1808).
Trim. in Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 565. Hook. Journ. Bot. i. t. 130.

Stem 2–4 ft., erect, slender, quadrangular, scabrous with small hooked hairs; l. distant, 2–3 in., ovate, subcordate at base but slightly decurrent on petiole, obtuse, strongly crenate-serrate, scabrous with bristly hair on both sides, petiole 1–1½ in.; fl. on very short ped., distant, spikes very long, often 2 ft. or more, bracts small, linear, hispid; cal. about ¼ in., teeth acute; cor.-tube over ½ in.; fil. hairy; fruit ¼ in., rounded, compressed, glabrous, spines short, stout, curved.

Dry region; very rare. About Tissamaharama Tank, S. Prov., frequent. Fl. December; pure white.

Also in S. India and Africa.

Verbena venosa, Gill. & Hook., a native of South Brazil, &c., has escaped from gardens in the hills, and is often found in a wild state on roadsides and waste ground about Nuwara Eliya.

6. **CALLICARPA,** *L.*

Small tree, branchlets young shoots, &c., covered with a thick stellate tomentum, l. opp., entire; fl. small, numerous, in dichotomous axillary cymes; cal. very small, cup-shaped,

nearly truncate, very faintly 4-lobed; cor.-tube short, broad, lobes 4, equal, short, spreading; stam. 4, much exserted; ov. 2-celled, with 2 ovules in each cell, stigma dilated, faintly 2-lobed; drupe juicy, pyrenes normally 4, 1-seeded.—Sp. 30; 12 in *Fl. B. Ind.*

C. lanata, *L. Mant.* ii. 331 (1771). **Illa,** *S.*

Herm. Mus. 11. Burm. Thes. 26. Fl. Zeyl. n. 59. *Tomex tomentosa*, L. Sp. Pl. 118. Moon Cat. 10. *C. tomentosa*, L. Syst. Veg., ed. 13, 130 (1774). *C. Wallichiana*, Walp., Schauer in DC. Prod., xi. 641; Thw. Enum. 243. C. P. 722.

Fl. B. Ind. iv. 567. Wight, Ic. t. 1480 (*C. Wallichiana*).

A small or moderate-sized bushy tree, branchlets stout, cylindrical, closely covered with a thick felt (easily detached) of stellate hair, young parts very densely stellate-tomentose; l. large, 6–9 in., ovate, rounded or obtuse at base, slightly acuminate, acute, entire, glabrous (when mature), rugose and bright green above, densely covered with a close felt of white or yellowish stellate hair beneath, petiole ¾–2 in., stout, very tomentose; fl. sessile, in clusters of 3, cymes shortly pedunculate, divaricately branched, densely stellate-tomentose, bracts linear; cal. membranous, stellate-tomentose; cor. glabrous, tube ⅛ in., lobes oblong, obtuse, recurved; drupe under ¼ in., globose, black, shining.

Moist region up to 4000 ft.; very common. Fl. March, September; pale pinkish-lilac, anth. cream-coloured.

Throughout the Indian Peninsula.

The leaves and bark are mucilaginous, and used both internally and externally. The latter is said to be also chewed.

Tectona grandis, L. f., the Teak tree, though common in India, Burma, and Malaya, does not occur wild in Ceylon. It is, however, a commonly planted tree in the moist region.

7. **PREMNA,** *L.*

Shrubs or trees, sometimes climbing, l. opp., simple; fl. small, usually in terminal corymbose or paniculate cymes; cal. small, cup-shaped, entire or 2-lipped or with 5 segm.; cor. with a short broad tube, hairy or woolly in the throat, lobes 4, one usually larger than others, so as to be more or less 2-lipped; stam. 4, didynamous or equal, more or less exserted; ov. 2- or 4-celled, with 4 ovules; drupe small, surrounded at base by often enlarged cal., stone hard, normally 4-celled and 4-seeded.—Sp. 40; 30 in *Fl. B. Ind.*

The species are somewhat obscure, and 4–6 are a good deal involved, and difficult to distinguish.

Climbing; cal. truncate	1. P. PURPURASCENS.
Erect.	
Cal. distinctly 2-lipped.	
Lips entire	2. P. CORYMBOSA.
One lip 2-lobed	3. P. SERRATIFOLIA.
Cal.-segm. 5, equal.	
L. entire or very nearly so.	
L. densely stellate-woolly beneath	4. P. TOMENTOSA.
L. simply pubescent beneath .	5. P. THWAITESII.
L. glabrous or nearly so beneath .	6. P. LATIFOLIA.
L. coarsely dentate, quite glabrous .	7. P. PROCUMBENS.

1. **P. purpurascens,** *Thw. Enum.* 242 (1861). [PLATE LXXII.]
C. P. 2698.
Fl. B. Ind. iv. 574.

A large woody climber, bark smooth, grey, branches cylindrical, l. 3–6 in., oval-oblong, rounded or subcordate at base, suddenly and shortly acuminate, obtuse, entire, glabrous on both sides, finely reticulate beneath, petiole $\frac{3}{4}$–1 in., fl. very small, numerous, on very short ped., cymes rather dense, much and divaricately branched, puberulous, purplish, stalked, axillary and terminal, bracts very small, caducous; cal. very small, truncate; cor. with a dense tuft of white woolly hair in throat, lobes nearly equal, obtuse, reflexed; fil. equal; fruit not seen.

Moist low country below 1500 ft.; very rare. Kitulgala; Ambagamuwa; near Badamuwa and Nillowe, S. Prov. Fl. Feb., March; dull brownish-purple.

Endemic? (perhaps in S. India).

A beautiful plant; the dense panicles of small flowers are sweet-scented, and the young leaves delicately reticulated with purplish veins.

2. **P. corymbosa,** *Rottl. in Neue Schr. Ges. Nat. Freunde Berlin,* iv. 187 (1803).
P. cordifolia, Thw. Enum. 243 (non Roxb.). C. P. 193.
Fl. B. Ind. iv. 573. Wight, Ic. t. 1483 (*P. cordifolia*).

A shrub, branches numerous, slender, virgate, pubescent; l. 2–3$\frac{1}{2}$ in., ovate, rounded or cordate at base, acuminate, acute, entire, glabrous or pubescent on both sides, or pubescent or woolly beneath only, very finely reticulate, petiole $\frac{1}{2}$–1 in.; fl. on short ped., cymes several, small, close, opp., together forming a small terminal flat-topped infl., bracts very small, filiform; cal. oblong-ovoid, glabrous, distinctly 2-lipped, lips rounded, entire or the lower one very faintly 3-lobed, enlarged in fruit; cor. very hairy and closed at mouth, upper lip hooded, entire, lower lip 3-lobed, lobes rounded, concave, the 2 lat. ones reflexed and the middle one cupped and projecting much beyond the rest; drupe over $\frac{1}{4}$ in., irregularly

globose, purple-black, shining, stone thin, 1–4-celled and -seeded.

Dry and intermediate regions; rather rare. Kurunegala; Haragama; Bintenne; Galagama; Tissamaharama; Trincomalie. Fl. Dec.–Feb., Sept.; pale dingy yellowish-purple or brown.

Also in S. India.

The leaves have a faintly smoky-aromatic scent when bruised.

3. **P. serratifolia,** *L. Mant.* ii. 253 (1771). **Midi,** *S.* **Erumaimullai,** *T.*

Herm. Mus. 14. Burm. Thes. 209. Fl. Zeyl. n. 416 (*Cornutioides*). *Cornutia corymbosa*, Burm. f. Fl. Ind. 132. *P. integrifolia*, L. Mant. ii. 253. Moon Cat. 45. Thw. Enum. 242. C. P. 1953.

Fl. B. Ind. iv. 574 (*P. integrifolia*). Burm. f. Fl. Ind., t. 41 f. 1 (bad). Wight, Ic. t. 1469.

Small tree or shrub, bark yellowish, thin, lenticellate, young parts glabrous or very slightly pubescent; l. 2–3 in., broadly oval, acute or rounded at base, acute or subacute, entire or faintly crenate-serrate in upper part, always quite glabrous; fl. on short pubescent ped., cymes corymbosely paniculate, dense, pubescent, terminal; cal. shallow, 2-lipped, one lip entire, the other 2-lobed (so that cal. appears 3-lobed), segm. obtuse; cor.-lobes rounded, lower ones somewhat longest; stam. slightly exserted; drupe $\frac{1}{6}$ in., globose.

Dry region; common. Fl. March, September; pale yellowish-green.

Also in India, Andaman and Nicobar Is., and Malaya.

Linnæus made two species of this, and the Fl. B. Ind. adopts his other name, *P. integrifolia*, for it, but excludes his reference to Burman, on which that was mainly founded. Burman's plant is in Fl. B. Ind. referred to *P. corymbosa*, but he obviously intended it for this; for, though his figure is too imperfect to be of any use, Hermann's specimens on which it is based are the present species.

The leaves have a peculiar scent, mixed fetid and lemon-like, and are used for flavouring native soups and curries. An aromatic oil is also obtained from the root, and used as a remedy in disorders of the stomach.

Wood white, rather hard, fine-grained.

4. **P. tomentosa,** *Willd. Sp. Pl.* iii. 314 (1800). **Bu-séru,** *S.* **Kolukkutti,** *T.*

Moon Cat. 45. Thw. Enum. 243. C. P. 747.

Fl. B. Ind. iv. 576. Wight, Ic. t. 1468. Bedd. Fl. Sylv. t. 251.

A tree, bark fibrous, yellowish, shredding off in longitudinal flakes, branchlets covered with a dense yellow wool of stellate hair; l. 4–6 in., ovate, rounded or subcordate at base, acuminate, acute, entire, densely woolly with stellate hair when young, becoming glabrous (or nearly so) above when mature, petiole 1–2 in., woolly-pubescent; fl. on very short pubescent ped., numerous, cymes rather close, stellate-pubescent, terminal; bracts linear; cal. stellate-hairy, segm. 5,

equal; cor.-lobes rounded, one considerably longer; stam. slightly exserted; drupe $\frac{1}{4}$ in., broadly ovoid, sparsely stellate-hairy, stone 4-celled, 4-seeded.

Low country up to 4000 ft.; common. Fl. Sept., Jan., Feb.; dirty yellow.

Also in Peninsular India.

Willdenow's species was based on *Cornutia corymbosa*, Lam. (non Burm. f.), which is rather doubtfully this plant. Does not turn black in drying. Wood yellow, rather hard and heavy, fine-grained, smooth.

5. **P. Thwaitesii,** *Clarke in Fl. B. Ind.* iv. 579 (1885).
P. micrantha, Thw. Enum. 242 (non Schauer). C. P. 2541.
Fl. B. Ind. iv. 579.

A small tree, 8–10 ft., young parts densely pubescent; l. 2–3 in., oval or ovate-oval, subacute or rounded at base, usually somewhat acuminate, subacute, entire or dentate-serrate in upper part, finely puberulous above, densely and softly pubescent beneath, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., pubescent; fl. on short pubescent ped., cymes small, much-branched, rounded, rather dense, tomentose-pubescent, bracts small, linear; cal.-segm. 5, deep, lanceolate, acute, nearly equal, pubescent; cor. hairy in throat, lobes short, truncate; drupe small, $\frac{1}{6}$ in., nearly globose.

Moist or intermediate region to 4000 ft.; rare. Maturata Dist.; near Hanguranketa; near Wilson's Bungalow, Uva. Fl. Sept., December; pale greenish-yellow, darker within.

Endemic.

Leaves with a very strong scent; the leaf-pubescence beneath is violet-pink in colour.

6. **P. latifolia,** *Roxb. Hort. Beng.* 46 (1814). **Maha-midi,** *S.* **Pachumullai,** *T.*
Thw. Enum. 242. C. P. 2893.
Fl. B. Ind. iv. 577 (not given for Ceylon). Wight, Ic. t. 869.

Tree, usually small, bark white, nearly smooth; l. 1$\frac{1}{2}$–3 in., broadly oval or subrotundate, rounded or subcordate at base, shortly acuminate, acute, entire, usually quite glabrous when mature, often with hair when young which sometimes persists beneath at least on the veins, petiole $\frac{1}{4}$–1 in., slender; fl. on short ped., cymes rather small, generally terminating short lateral branchlets, bracts caducous; cal. pubescent, much enlarged in fruit, segm. 5, shallow, acute; cor. lobes oblong, one broader than rest; drupe $\frac{1}{4}$ in., globose, smooth, black, juicy, surrounded by enlarged cal., stone 4-celled.

Dry region; rather common. Trincomalie (Glenie); Mannar; Sigiri; Uma-oya; Lenadore; Lagalla. Fl. Feb., July–October; yellowish or white.

Throughout India and Burma.

A very variable plant, and perhaps more than one species is included here. The ordinary Ceylon form has small long-stalked leaves, not cordate at the base, usually quite smooth on both surfaces when mature, and drying more or less black. A form from Uma-oya has a fine dense pubescence on both surfaces of the leaves, which dry green, and the flowers are white. Another form has the young l. with simple villous hair, but the adult ones quite glabrous; this also does not turn black in drying.

The plant has the strong fetid smell which is so much liked by the natives, and the leaves are used in the Northern Prov. in making 'choti' soup, and more rarely for flavouring curries, and are considered a stomachic and tonic.

Clarke in Fl. B. Ind. refers C. P. 2893 to *P. tomentosa* as var. *detergibilis*. I am unable to follow him in this. The hairs on the young leaves are simple, not stellate. One sheet of this number, however (from Kalutara), is different from the rest in its larger leaves, with more and deciduous pubescence, and drying black, and it may be to this that he refers. I believe this form to be always cultivated in Ceylon.

7. ***P. procumbens,*** *Moon Cat.* 45 (1824). **Mullai,** *T.*

Wall. Cat. n. 1780. Schauer in DC. Prod. xi. 636. Thw. Enum. 243. C. P. 325.

Fl. B. Ind. iv. 580.

A small undershrub, branches nearly cylindrical, thickened at the nodes, bark yellowish-white, smooth, young parts finely pubescent; l. articulated and readily detached, 2–4 in., ovate-oblong, obtuse or rounded at base, subacute, undulate, usually very coarsely serrate-dentate, glabrous when mature, slightly pubescent on veins beneath when young, petiole $\frac{1}{2}$–$1\frac{1}{2}$ in.; fl. on slender ped., small, dense, rounded, much branched; cal. campanulate, enlarged in fruit, nearly glabrous, segm. very shallow, obtuse; cor. with a few hairs in throat, lobes nearly equal; stam. nearly equal; drupe $\frac{1}{5}$ in., obovate-ovoid, tuberculate, stone thin, 4-seeded.

Low country in dry region; rare in a wild state. Moon's locality is Uva. The C. P. specimens are from Pelmadulla (Gardner) and Balangoda (Thwaites), and are in flower and fruit. Fl. Feb. and Sept.

Endemic (?).

This I take to be the small shrub frequently cultivated in native gardens, especially in the dry region, as a curry plant, but I have never seen it flowering nor met with it wild; yet it seems to be known only from Ceylon.

8. **GMELINA,** *L.*

Trees or shrubs, l. opp., entire, fl. large, in terminal panicles; cal. cup-shaped, 4- or 5-toothed; cor. funnel-shaped, ventricose in upper part, lobes 4 or 5, the lowest one largest, and forming a projecting lower lip; stam. 4, didynamous, slightly exserted, anth.-cells distinct, pendulous; ov. 4-celled,

with 1 ovule in each cell, style slender, stigma bifid; drupe succulent, stone bony, 2–4-celled and -seeded.—Sp. 8; 5 in *Fl. B. Ind.*

L. over 3 in., white with woolly-pubescence beneath; cal.-segm. 5 . . . . . . 1. G. ARBOREA.
L. under 2 in., glabrous beneath; cal.-segm. 4 2. G. ASIATICA.

1. **G. arborea,** *Roxb. Cor. Pl.* iii. 41 (1819). **Ét-demata,** *S.* Moon Cat. 45. *G. Rheedei*, Hk., Thw. Enum. 244. C. P. 128.
Fl. B. Ind. iv. 581. Wight, Ic. t. 1470. Bot. Mag. t. 4395 (*G. Rheedii*). Bedd. Fl. Sylv. t. 253.

A large-spreading tree, bark greyish-yellow, rather rough, thick, branchlets and young parts covered with a very fine, white mealy pubescence; l. articulated, 3–7 in., broadly ovate, rounded or cordate at base, acuminate, acute, entire, glabrous above when mature, densely woolly-pubescent beneath with pale yellowish stellate hair, veins prominent beneath, where also at the base below the lowest pair of veins are 2 large pits or glands, petiole 3–5 in., cylindrical, puberulous; fl. large, numerous, on short hairy ped. in small stalked cymes of 3, arranged in a narrowly pyramidal, hairy, terminal panicle, bracts linear, buds clavate, angular; cal.-segm. 5, small, densely tomentose; cor. $1\frac{1}{2}$ in., densely hairy outside, lobes spreading or recurved, lowest one much longest, projecting forwards, ovate, obtuse; drupe about 1 in., ovoid or pyriform, smooth, orange-yellow, stone ovate-ovoid.

Moist region up to 5000 ft.; rather common, but often cultivated. Fl. March; 4 upper lobes dull orange-pink, lower one lemon-yellow.

Also in India, Burma, Malaya, and Philippine Is.

The flowers suggest a Bignoniaceous plant. They appear along with the young foliage, the tree being deciduous. Wood yellowish-white, even-grained, light, strong, tough, and durable; an excellent timber. The bark and the fruit are employed as medicine in bilious fevers.

2. **G. asiatica,** *L. Sp. Pl.* 626 (1753). **Demata,** *S.* **Kumil,** *T.* Herm. Mus. 3. Fl. Zeyl. n. 230. Moon Cat. 45. Thw. Enum. 244. C. P. 1952.
Fl. B. Ind. iv. 582. Wight, Ill. t. 174.

A much-branched bush, bark yellowish-white, smooth, branchlets horizontal, rigid, often compressed, puberulous, frequently much shortened and spinous at the end; l. small, $\frac{3}{4}$–$1\frac{3}{4}$ in., oval, acute or rounded at base, obtuse, entire, glabrous on both sides, paler and dotted with minute white glands beneath, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. large, nodding on short pubescent ped., in terminal racemes or panicles, bracts small, deciduous; cal. somewhat contracted at mouth, pubescent, with several large flattened oval glands on the upper part,

segm. 4, very short, acute; cor. 2 in., finely pubescent outside, tube curved, lobes 4, ovate, subacute, lowest one largest; drupe $\frac{3}{4}$ in., obovate-ovoid, yellow, stone 1- or 2-celled and -seeded.

Open places in low country up to 2000 ft.; common. Fl. September; bright sulphur-yellow.

Also in South India.

The bark and roots are used in medicine. The fruits are eaten.

9. **VITEX,** *L.*

Trees or shrubs, l. opp., palmately 3- or 5-foliolate (very rarely simple), entire; fl. usually small, in small cymes usually combined into terminal panicles; cal. campanulate, segm. 5, very short; cor. with a short tube, 5-lobed, the lowest much the largest and forming a lower lip; stam. 4, didynamous, somewhat exserted; ov. 2- or 4-celled, ovules 4, stigma bifid; drupe invested at base by enlarged cal.; stone bony, normally 4-celled and 4-seeded but some often suppressed.—Sp. 60; 18 in *Fl. B. Ind.*

Cymes in terminal panicles.
  Shrubs or small trees.
    Lflts. oblong-oval, obtuse . . . 1. V. TRIFOLIA.
    Lflts. linear-lanceolate, acute . . 2. V. NEGUNDO.
  Large tree . . . . 3. V. ALTISSIMA.
Cymes axillary . . . . 4. V. LEUCOXYLON.

1. **V. trifolia,** *L. Sp. Pl.* 638 (1753). **Nochchi.** *T.*

Herm. Mus. 48. Burm. Thes. 229. Fl. Zeyl. n. 413. Thw. Enum. 244. C. P. 1955.

Fl. B. Ind. iv. 583. Rheede, Hort. Malab. ii. t. 11. Bot. Mag. t. 2187.

A bush, bark smooth, pale grey, l. variable, some simple and some 3-foliolate with the lat. lflts. smaller, l. $1\frac{1}{4}$–$2\frac{1}{2}$ in., obtuse at both ends, lflts. sessile, tapering to base, obtuse, all entire, glabrous above, very finely and closely white-pubescent beneath, petiole about $\frac{1}{2}$ in., pubescent, fl. on short ped., cymes paniculate, 1–2 in. long, pubescent; bracts minute; cal. white-pubescent, enlarged in fruit, segm. obscure; cor. pubescent outside, tube cylindrical-funnel-shaped, $\frac{1}{4}$ in., mouth oblique, upper lip with 2 obtuse lobes, lower 3-lobed, the middle one much the longest; stam. much exserted; drupe globose, about $\frac{1}{4}$ in., the lower half or more closely invested by the enlarged cal., slightly scurfy, purplish-black, stone usually 1-celled by abortion.

Low country, generally near the seacoast; rather common, especially in the dry region. Fl. Aug.–September; bright pale purple.

Throughout Tropical Asia and Australia.

The foliage is pleasantly aromatic. There is no specimen or drawing in Hermann's Herb., and the figure in Burm. Thes. t. 109 referred to this by Willdenow is certainly not a *Vitex* at all.

2. **V. Negundo,*** *L. Sp. Pl.* 638 (1753). **Nika, Nil-nika, Sudu-nika,** *S.* **Vennochchi,** *T.*

Herm. Mus. 47. Burm. Thes. 229. Fl. Zeyl. n. 414. Moon Cat. 46. Thw. Enum. 244. C. P. 183, 1956.

Fl. B. Ind. iv. 583. Rheede, Hort. Malab. ii. t. 12. Wight, Ic. t. 519 (bad).

A shrub or small slender tree, branchlets quadrangular, finely pubescent; l. palmate, petiole 1½–2½ in., slender, pubescent, lflts. 3 or 5, the two lowest smaller and nearly sessile, the others long-stalked, 3–4 in., linear-lanceolate, acute and often unequal at base, tapering to very acute apex, nearly glabrous above (when mature), densely covered with fine white pubescence beneath; fl. numerous, on very short pubescent ped., cymes small, stalked, opp., on erect branches of erect pyramidal terminal panicle, bracts caducous; cal. small, pubescent, segm. short, triangular; cor. pubescent outside, tube hairy within, 4 upper lobes short, triangular, lowest one large, rounded, forming lower lip; drupe under ¼ in., nearly globose, black.

Low country, borders of streams, especially in the dry region, common; also much grown in native gardens. Fl. all the year; bright lilac-blue.

Throughout India, Afghanistan, Eastern Asia, and the Philippine Is.

There is no specimen or drawing in Herb. Hermann.

Leaves sweetly aromatic when bruised. They are much used in native medicine as a fomentation in rheumatism; the root is also employed as a tonic.

3. **V. altissima,** *L. f. Suppl. Pl.* 294 (1781). **Milla, Miyan-milla, Sapu-milla,** *S.* **Kaddamanakku,** *T.*

V. trifolia, Moon Cat. 46 (non L.). Thw. Enum. 244. C. P. 1958.

Fl. B. Ind. iv. 584. Wight, Ic. t. 1466. Bedd. Fl. Sylv. t. 252.

A very large tree, with a dense head and somewhat drooping branches, bark yellowish-grey, vertically cracked; l. compound, petiole about 2½ in., glabrous, sometimes very slightly winged, thickened at base, lflts. 3 (very rarely 5), sessile, 2½–6 in., lanceolate, acute at base, acuminate, acute, entire, glabrous above, more or less pubescent beneath, venation pellucid, lat. veins prominent beneath, intermediate venation minutely reticulate; fl. numerous, on very short ped., erect,

---

* Negunda is said by Rheede to be the Hindu name of this and *V. trifolia*, and is given by Garcia ab Orto, Acosta, and other early writers.

cymes short, crowded, dichotomous, one-sided, in large, lax, pyramidal, pubescent, terminal panicles, bracts immediately beneath fl., $\frac{1}{6}$ in., oblong, obtuse, puberulous; cal. pubescent on both sides, segm. rather short, oval, obtuse, spreading; cor. slightly pubescent outside, limb campanulate, 2-lipped, upper lip with 2 short, acute, triangular lobes, lower 3-lobed, the middle more than twice as large as the lat. ones; drupe irregularly globose, under $\frac{1}{2}$ in., supported on enlarged flattened cal., purple, often with small white dots, smooth.

Var. β, **zeylanica,** *Clarke.* *V. zeylanica,* Turcz. in Bull. Mosc., 1863, ii. 223.

Lflts. quite glabrous beneath.

Var. γ, **alata,** *Trim.* (*V. alata,* Heyne. *V. appendiculata,* Rottl.).

L.-petiole always rather broadly winged, widened and cordate at base, lflts. very finely pubescent above, densely grey-pubescent beneath; fl. more laxly arranged.

Low country, principally in the dry region; common. Var. γ, near Mulliativu (J. P. Lewis). Fl. July–Oct.; very pale violet or white, with the middle lobe of lower lip bluish.

Also in Peninsular India.

Var. β is scarcely worth notice. Var. γ is kept as a species in Fl. B. Ind., but not given for Ceylon. Mr. J. P. Lewis informs me that it has a different habit of growth to the ordinary tree, being taller and straighter. He found a few trees only at Vavaddai and Neduchaddikkulam.

A valuable timber-tree. Wood hard, heavy, close-grained, smooth, tough, durable, grey; the carpenters distinguish several varieties. The bark is used as a fomentation in rheumatic swellings. The wood affords a yellow dye, which is not much employed.

V. pinnata, L. Sp. Pl. 638 (1753), is an earlier name, but applies only to a variety with 5 leaflets collected by Hermann; this is Fl. Zeyl. n. 415 (*Pistacio-vitex*). The specimens are densely tomentose-pubescent. (Linnæus quotes also for this Burm. Fl. Ind. 138 and the figure t. 43, f. 2, which is very poor indeed.) This Fl. Zeylan. plant is again quoted by Vahl under his *V. pubescens* (Symb. Bot. iii. 85) in 1794, and this species is kept up in Fl. B. Ind. iv. 585, and is given for Ceylon 'frequent' on the faith of a specimen from Mrs. Walker (n. 1122). It is figured in Wight, Ic. t. 1465 (*V. arborea*), but I have never seen anything in Ceylon like this figure.

4. **V. Leucoxylon,** *L. f. Suppl. Pl.* 293 (1781). **Nébedda,** *S.* **Kaddu-nochchi, Nir-nochchi,** *T.*

Thw. Enum. 244. C. P. 1957.

Fl. B. Ind. iv. 587. Wight, Ic. t. 1467 (*Wallrothia Leucoxylon*).

A large tree with spreading head, bark smooth, white, thin, young parts slightly pubescent; l. compound, petiole $1\frac{1}{2}$–3 in., glabrous, lflts. usually 5 (sometimes 3), stalked unequal, the terminal, 3–$3\frac{1}{2}$ in., twice as large as the basal

pair, oblong-oval, acute at base, obtuse, entire, glabrous, or very slightly pubescent beneath, rather thick, venation pellucid, finely reticulate, fl. moderate-sized, on short pubescent ped., cymes axillary, long-stalked, dichotomous, lax, spreading, bracts long, linear; cal. pubescent, segm. shallowly triangular, acute; cor. densely pubescent outside, the 4 upper lobes oval-oblong, obtuse, the lowest larger, crisped, hairy in the centre; drupe supported on enlarged flattened cal., about $\frac{3}{4}$ in, broadly oblong-ovoid, very blunt, smooth, dark purple, stone large, 4-celled and -seeded.

Dry country; common, especially near tanks. Fl. July, Aug.; white with purplish hair.

Also in Southern India.

First noticed by Kœnig. Wood dark grey, hard, fine-grained, durable, shining.

10. **CLERODENDRON,*** *L.* (*Clerodendrum*).

Shrubs or small trees, rarely sub-scandent; l. opp., simple; fl. rather large, in small cymes, usually combined into terminal panicles; cal. campanulate, segm. 5, sometimes enlarged in fruit; cor.-tube usually long, lobes 5, the lowest one usually longer than the rest; stam. 4, didynamous, much exserted; ov. 2- (or 4-) celled, ovules 4, style bifid; fruit dry or succulent, with 4 pyrenes (1 to 3 often suppressed).—Sp. 70; 22 in *Fl. B. Ind.*

Cymes small, axillary, distinct . . . . . 1. C. INERME.
Cymes collectively forming a terminal panicle.
  Cal. not enlarged in fruit.
    Cal.-segm. long, ovate, acuminate . . 2. C. PHLOMIDIS.
    Cal.-segm. very short, broadly triangular . 3. C. SERRATUM.
  Cal. much enlarged in fruit . . . . . 4. C. INFORTUNATUM.

1. **C. inerme,** *Gaertn. Fruct.* i. 271 (1788). **Wal-gurenda,** *S.* **Pinchil, Pinari,** *T.*

Herm. Mus. 23. Burm. Thes. 127. Fl. Zeyl. n. 231. *Volkameria inermis*, L. Sp. Pl. 637. Moon Cat. 46. Thw. Enum. 243. C. P. 1947. Fl. B. Ind. iv. 589. Rheede, Hort. Malab. v. t. 49.

A shrub, 3–5 ft., much-branched, with virgate glabrous twigs, bark pale brown; l. small, 1–1$\frac{1}{2}$ in., oval or oblong-oval, acute at base, obtuse, entire, quite glabrous, rather thick, copiously gland-dotted beneath, petiole $\frac{1}{4}$ in.; fl. moderate-sized, on rather long ped., cymes 3-fld. axillary, peduncles shorter than l.; cal. glabrous, segm. triangular, acute, rather

* From κλῆρος, a lot (in a lottery). Name given by Burman, suggested by Hermann's Latin name for No. 4.

spreading; cor. glabrous, tube very slender, 1–1¼ in., hairy within, slightly split down back, lobes nearly equal, about ⅜ in., oblong, obtuse or subacute, spreading or reflexed, stam. and style very much exserted; fruit ¾ in., pyriform, very blunt, dry, smooth, brown, splitting into 4 woody pyrenes.

On the seashore; very common. Fl. July–December; white, tinged externally with pink, fil. and style purplish.

Also in India and Burma.

The foliage has a peculiar fetid but rather aromatic odour when bruised, and a hot taste; and the vernacular names are the same as for *Celtis cinnamomea*, the scent of which is very much more offensive (q. v.). I do not know that it is used in native medicine here, but in India the plant is much esteemed as an alterative and tonic.

2. **C. Phlomidis,** *L. f. Suppl. Pl.* 292 (1781). **Vatamadakki,** *T.*
Moon Cat. 46. Thw. Enum. 243. C. P. 1950.
Fl. B. Ind. iv. 590 (*C. phlomoides*). Wight, Ic. t. 1473.

A semi-scandent bush or small tree, branches pubescent, whitish-grey; l. small, 1–2 in., readily disarticulating, deltoid-ovate, often broader than long, truncate or subcordate at base, obtuse, often apiculate, coarsely crenate-dentate, undulate, rather thick, puberulous beneath, petiole ½–1 in.; fl. moderate-sized, on slender pubescent ped., cymes small, dichotomous, axillary, combined to form a rounded, terminal panicle, bracts small, leafy, oblong, obtuse, mucronate; cal. large, over ⅜ in., segm. cut fully half way, ovate, acuminate, glabrous, veiny; cor.-tube ¾ in., slightly pubescent outside, lobes ⅓ in., very nearly equal, oval, obtuse; drupe not seen, 'much as in *C. inerme*.'

Dry and desert districts; rather rare. Batticaloa; Kirinda, S. Prov.; Mantai, N. Prov. Fl. Dec.–March; bright rose-pink, rarely white.

Also in dry parts of India.

The specific name is usually but incorrectly given as '*phlomoides*.'

3. **C. serratum,** *Spreng. Syst. Veg.* ii. 758 (1825). **Ken-henda,** *S.* **Vatamadakki,** *T.*
Moon Cat. 46. Thw. Enum. 243. C. P. 1951.
Fl. B. Ind. iv. 592. Wight, Ic. t. 1472. Bot. Mag. t. 2536 (*C. macrophyllum*).

A shrub, stem 4–8 ft., slightly branched, bluntly quadrangular, bark yellow, smooth, young parts glabrous; l. large, 4–8 in., passing into bracts above, oval or ovate-oval, acute at both ends, very coarsely and sharply serrate, glabrous, petiole very short, stout; fl. large, on short, stout, compressed, pubescent, deflexed ped., cymes numerous, lax, pubescent, dichotomous, with a pair of acute bracts at each branching and a flower in the fork, each in axil of a large leafy bract, and collectively forming a long, lax, terminal, erect panicle;

cal. puberulous, segm. very short, broadly triangular, ciliolate; cor.-tube short, $\frac{1}{4}$–$\frac{3}{8}$ in., somewhat inflated, oblique at mouth, upper and lat. lobes $\frac{1}{2}$ in., broadly oval, flat, spreading, lowest one (lip) $\frac{3}{4}$ in., oblong, very concave, deflexed; fil. much curved, hairy at base; fruit depressed, somewhat succulent, normally 4-lobed, with a pyrene in each lobe (1–3 often suppressed).

Moist low country up to 2000 ft.; common. Fl. June–September; cor. with posterior and lateral lobes pale blue, anterior one dark bluish-purplish.

Also in India, Burma, and Malaya.

A handsome plant. The flowers are usually reversed by reflexion of the ped., so that the large hooded anterior cor.-lobe stands up at the back of the flower. The leaves have a faint scent, and are used in medicine.

4. **C. infortunatum,*** *L. Sp. Pl.* 637 (1753). **Gas-pinna,** *S.*
Herm. Mus. 25, 45. Burm. Thes. 66. Fl. Zeyl. n. 232. Moon Cat. 46. Thw. Enum. 243. C. P. 2894.
Fl. B. Ind. iv. 594. Burm. Thes. t. 29. Wight, Ic. t. 1471.

A shrub or small slender tree, 4–10 ft., branchlets very bluntly quadrangular, yellowish silky-pubescent; l. large, 4–6 in., ovate, cordate or rounded at base, acuminate, acute or subacute, entire, thinly hairy on both sides, especially on the veins beneath, somewhat 3-nerved from the base, venation prominent beneath, petiole $1\frac{1}{2}$–3 in., cylindrical, pubescent; fl. large, on rather long pubescent ped., cymes stalked, in large, lax, pyramidal, pubescent panicles, bracts leafy, deciduous; cal. $\frac{1}{2}$ in., silky-pubescent, very much enlarged in fruit, segm. deep, lanceolate, very acute; cor.-tube about 1 in., slender, lobes large, $\frac{1}{2}$ in., oblong, obtuse; drupe $\frac{1}{3}$ in., nearly globose, succulent, purplish-black, shining, seated in centre of the very much enlarged, spreading, succulent, bright pink cal. $1\frac{1}{2}$ in. diam., pyrene usually solitary, brittle.

Moist region up to 5000 ft.; common. Fl. April–August; white.

Also in India and Malaya.

Leaves have a smoky odour when bruised; they are used as an anthelmintic.

C. Siphonanthus, Br., a native of India, is frequently found as a weed by roadsides, &c. It is a tall showy plant figured in Wight, Ill. t. 173.

11. GLOSSOCARYA, *Wall.* (*Griff.*).

Semi-scandent shrub, l. opp., entire; fl. small, numerous,

---

* This name is due to Hermann (l. c.), who so translates the Sinhalese 'Pinnakola;' he has also (l. c. 54) a '*planta fortunata*' (= 'Pinna,' S.), which is probably the same species. I do not know the origin of these terms.

in close dichotomous cymes forming large corymbose panicle; cal.-tube cup-shaped, limb spreading, segm. 5, broad; cor.-tube slender, cylindrical, lobes 5, nearly equal, the lowest rather largest; stam. 4, fil. very long, slightly didynamous; stigma bifid; fruit capsular, dehiscent from base into 4 valves, each of which carries with it 1 seed, which is held by one inflexed margin.—Sp. 3; 2 in *Fl. B. Ind.*

G. scandens, *Trim. Syst. Cat. Ceyl.* 69 (1885). [PLATE LXXIII.]
Volkameria scandens, L. f. Suppl. Pl. 292. *Clerodendron Linnæi*, Thw. Enum. 243. *G. Linnæi*, Benth. ex Clarke, Fl. B. Ind. iv. 598. C. P. 1948.
Fl. B. Ind. iv. 598 (*G. Linnæi*).

A straggling, sub-scandent shrub, bark smooth, pale, young parts finely pubescent, branches divaricate, occasionally converted into short, rigid, horizontal spines; l. 3–4 in., ovate, subcordate at base, acute, entire, glabrous or slightly pubescent, minutely gland-punctate beneath, venation finely reticulate, pellucid, petiole $\frac{1}{4}$ in.; fl. sessile, cymes compact, on rather long, stiff, divaricate, pubescent, axillary peduncles, the whole forming a large panicle, bracts oblong, acute, pubescent, passing into l. below; cal. finely pubescent, lobes broadly triangular, acute; cor.-tube $\frac{1}{3}$ in., lobes shorter; fil. 1 in.; style a little longer; capsule $\frac{3}{8}$ in., clavate-oblong, very blunt, finely tomentose, seed linear-oblong.

Forests of the dry region; rather rare. Jaffna (Gardner); Anuradhapura; near Kalawewa; Puttalam; Negombo. First collected in Ceylon by Kœnig, 'circa flumen magnum Monesi-moti-Kandel,' whose specimens are in Mus. Brit. Fl. December–March, and July–August; pure white.

Endemic.

A beautiful climber over large trees, which it covers with masses of blossom, but capable of growing as a bush. The fruit first splits septicidally into two halves, then each half again into two. There can be no doubt of this being the plant of Linn. fil., but his name is not quoted in Fl. B. Ind.

12. SYMPHOREMA, *Roxb.*

Climbing shrub, l. opp., toothed, fl. small, usually 7 in a head, surrounded by an involucre of 6 large bracts; cal. tubular, stellate-pubescent, segm. 6–8, toothlike, very short; cor.-tube short, cylindrical, lobes 6–8, equal, narrow; stam. 6–8, equal, inserted at edge of cor.-tube, exserted; ov. 2- (or 4-) celled, ovules 4, stigma shortly bifid; fruit dry, enclosed in cal., globose, indehiscent, 1-seeded.—Sp. 3; 2 in *Fl. B. Ind.*

S. involucratum, *Roxb. Cor. Pl.* ii. 46 (1798).
Thw. Enum. 242. C. P. 3645.
Fl. B. Ind. iv. 599. Wight, Ic. t. 362.

Shrubby, stems scandent, slender, young parts stellately-pubescent; l. small, $\frac{3}{4}$–$1\frac{1}{2}$ in., oval, rounded at base, subacute, coarsely crenate-serrate, nearly glabrous above (when mature), white, with close stellate-pubescence beneath, petiole very short; fl. crowded, bracts about $\frac{3}{4}$ in., lanceolate-oblong, semi-membranous, veiny, pubescent; cal. under $\frac{1}{4}$ in., ribbed, teeth oval, subacute; cor.-lobes as long as tube, linear, acute, reflexed; fruit $\frac{1}{6}$ in., glabrous.

Dry region; very rare. The C. P. specimens were collected near Trincomalie by Glenie; I have seen no others. Fl. white.
Also in Peninsular India.

13. AVICENNIA,* *L.*

Small tree, l. opp., entire, fl. moderate-sized, sessile, in small heads of 3 or 4, on short spikes arranged in terminal panicles, bracts small, ovate; cal. shallow, segm. 4, cut almost to base, much imbricate; cor.-tube short, cylindrical, lobes 4, spreading; stam. 4, inserted at mouth of tube; ov. imperfectly 4-celled, with 4 pendulous ovules, stigma bifid; fruit a soft capsule, dehiscent into 2 valves; seed solitary (rarely 2), quite without coats, radicle large, blunt, covered with long, fulvous, woolly hair, cotyledons very large, thick, and fleshy, folded together, one conduplicate, the other reduplicate.—Sp. 3; 1 in *Fl. B. Ind.*

A. officinalis, *L. Sp. Pl.* 110 (1753). **Kaṇṇá,** *T.*
Fl. Zeyl. n. 57. *A. tomentosa,* L. Gen. Pl. ed. 6, 579 (1764). Thw. Enum. 244. C. P. 1961.
Fl. B. Ind. iv. 604. Wall. Pl. As. Rar. iii. t. 271. Wight, Ic. t. 1481.

A bush or small tree, with smooth, white bark, young twigs quadrangular, white with fine pubescence; l. 2–$3\frac{1}{2}$ in., oval or oblong-oval, usually acute at base, rounded or sub-acute at apex, entire, glabrous and bright green above, paler and with a thin, dense felt of very fine pubescence beneath, coriaceous; fl. sessile, bracts shorter than cal.; cal.-segm. ovate, very obtuse, ciliate, concave; cor. $\frac{1}{2}$ in. diam., lobes oval, acute; fil. short, spreading; capsule about 1 in., obliquely ovoid, compressed, glabrous, pale greenish-yellow; seed com-

* Commemorates Abu Ben Sina (Avicenna), the celebrated Arab physician of Bokhara, who died A.D. 1037.

pletely filling fruit, cotyledons cordate or auriculate at base finely dotted all over, purplish.

In shallow salt water or sandy tidal flats on the coast; common. Fl. Aug.–October; pale dull yellow.

Throughout Tropical Asia, Africa, and America.

There is no specimen or drawing in Herm. Herb. This is one of the trees known as mangroves, and is often called 'White Mangrove.' The large embryo usually germinates in the fruit before it falls, but the tree has no stilts. It often occurs over large tracts of tidal or flooded shore to the exclusion of all other plants, as dwarf bushes half covered at high water. Its roots bear great numbers of erect processes (like those of *Sonneratia*), the points of which stand above the shallow water; these are capable of producing leaves and growing up into bushes, but rarely do so. They are figured in Schimper's 'Indo-Malay Strandflora' (1891), t. 6. When dry, the leaves turn black above and silvery-white beneath. The bark is astringent, and might be used for tanning purposes.

C.—LABIATÆ.

HERBS or undershrubs, stems usually quadrangular, l. opp. (rarely whorled) without stip., fl. bisexual, irregular, solitary or usually in opp. axillary fascicles or cymes forming whorls; cal. persistent, 2-lipped, or with 5 or 8 or 10 segm.; cor. tubular, more or less 2-lipped (rarely nearly regular), lobes 4 or 5, imbricate; stam. 4, didynamous, inserted in cor.-tube, anth. 2-celled with the cells often confluent or 1-celled; disk conspicuous; ov. superior, of two 2-celled carp., with a single erect ovule in each cell, style long, simple, stigma usually bifid; fruit of 4 small dry 1-seeded achenes in the base of the persistent cal., endosperm scanty or none.

Our 42 species of this very large Family (which is especially characteristic of dry, warm-temperate countries) are pretty equally divided between our three climatic regions, but are particularly noticeable in the hills, to which are restricted 6 (all) species of *Plectranthus*, 3 of *Pogostemon*, 2 of *Scutellaria*, and 1 each of *Geniosporum*, *Coleus*, *Calamintha*, and *Teucrium*—in all 15. *Orthosiphon*, *Dysophylla* (2), and *Leonotis*, and single species of *Ocimum*, *Anisochilus*, *Coleus*, *Anisomeles*, and *Leucas*—9 in all—are met with only in the dry region. There are 10 endemic species, mostly montane.

Cor. more or less 2-lipped (nearly regular in 9 and 10).
  Upper cal.-segm. broader, forming an upper lip (sometimes equal to rest in 5 and 6) (*Ocimoideæ*).
    Lower lip of cor. flat.
      Stam. exserted.
        Whorls 6-flowered . . . . . . 1. OCIMUM.
        Whorls many-flowered . . . . . 2. GENIOSPORUM.

Stam. included.
  Achenes smooth . . . . 3. MOSCHOSMA.
  Achenes tuberculate . . . . . . 4. ORTHOSIPHON.
Lower lip of cor. boat-shaped.
  Lower lip of cal. of 4 or 2 segm.
    Fil. free . . . . 5. PLECTRANTHUS.
    Fil. connate below . . . . . . 6. COLEUS.
  Lower lip of cal. truncate . . . . 7. ANISOCHILUS.
Cal.-segm. nearly equal (except in 11 and 15).
  Cor.-lobes flat (*Satureineæ*).
    Cor. distinctly 2-lipped.
      Cal.-segm. quite equal . . . . 8. POGOSTEMON.
      Lower 2 cal.-segm. larger . . . . 11. CALAMINTHA.
    Cor. nearly regular.
      Anth. 1-celled . . . . 9. DYSOPHYLLA.
      Anth. 2-celled . . . . 10. MENTHA.
  Upper lobe or lip of cor. concave or hooded (*Stachydeæ*).
    Cal. 2-lipped, segm. 0 . . . . . 12. SCUTELLARIA.
    Cal.-segm. 5 . . . . 13. ANISOMELES.
    Cal.-segm. 8 or 10.
      Segm. nearly equal . . . . . 14. LEUCAS.
      Uppermost segm. much largest . . . 15. LEONOTIS.
Cor. without an upper lip (*Ajugoideæ*) . . . 16. TEUCRIUM.

1. **OCIMUM,** *L.*

Annual or perennial herbs, sometimes semi-shrubby; fl. small, in cymes of three (*i.e.* whorls of 6), ped. more or less recurved, infl. slender, erect; cal. 2-lipped, the uppermost segm. broad, flat, erect, the lower lip with 4 mucronate teeth, the middle 2 the largest; cor.-tube short, upper lip 4-toothed, lower lip entire; stam. exserted, declinate, anth.-cells confluent; achenes smooth or rugose, enlarged cal. membranous and veined, strongly recurved—Sp. 40; 5 in *Fl. B. Ind.*

Lower cal.-lip longer than upper; l. under 2 in.
  L. acute . . . . 1. O. CANUM.
  L. obtuse.
    L. hairy . . . . 2. O. SANCTUM.
    L. nearly glabrous . . . . . . 3. O. ASCENDENS.
Lower cal.-lip shorter than upper; l. over 4 in. . 4. O. GRATISSIMUM.

1. **O. canum,** *Sims, Bot. Mag.* t. 2452 (1823). **Hin-tala,** *S.* **Kañchánkórai,** *T.*

O. minimum, Moon Cat. 44 (? Linn.). Thw. Enum. 236. C. P. 3624. Fl. B. Ind. iv. 607. Bot. Mag. t. 2452.

Annual, stem 1–2 ft., much branched, sub-quadrangular, striate, hispid-pubescent, with short crisp hair; l. small, $1\frac{1}{4}$–2 in., lanceolate or oval, acute at both ends, shallowly serrate, nearly glabrous, gland-dotted, petiole $\frac{1}{2}$–1 in., slender, with a

few hairs; whorls rather distant, bracts conspicuous, petiolate, lanceolate, acute, ciliate with long white hair, racemes short, crisply hairy; cal. hairy, upper lip squarely rotundate, broader than long, flat, ciliate, lower lip longer than upper, teeth lanceolate, mucronate; achenes ovoid, smooth.

Waste and cultivated ground; very common, but doubtfully native. Fl. August–October; white.

In most Tropical countries, wild or cultivated.

Leaves pleasantly aromatic when bruised; much grown in native gardens. *O. minimum*, L. Sp. Pl. 597, is *Rata-tala* of Herm. Mus. 41 (Fl. Zeyl. n. 511), and almost certainly this same species; but there is no specimen in Herm. Herb.

O. basilicum, L., *Suvanda-tala*, S., is the 'Sweet Basil'—a herb much grown in native gardens. Our form is generally perfectly smooth, with the leaves copiously gland-dotted, and with a very sweet aromatic scent when bruised. The flowers are white and large for the genus. A variety (*O. thyrsiflorum*, L.) is figured in Wight, Ic. t. 868. Hermann, Mus. 61, gives the S. name as *Tala-kola*.

2. **O. sanctum,*** *L. Mant.* i. 85 (1767). **Maduru-tala,** *S.*

Burm. Thes. 175. *O. inodorum*, Burm. Fl. Ind. 130. Thw. Enum. 236. C. P. 249.

Fl. B. Ind. iv. 609. Burm. Thes. t. 80, f. 2.

Annual, stem 1–2 ft., often slightly woody below, branches numerous, spreading, sub-quadrangular, with spreading hair, usually purplish; l. small, 1–1½ in., oval, obtuse at both ends, apiculate, usually distantly and coarsely serrate, undulate, softly and finely pubescent on both sides, minutely gland-dotted, petiole ½ in., slender, hairy; fl. very small, whorls close, bracts small, very broad, acuminate, hairy, racemes long, narrow, unbranched, hairy; cal. with long white hair, upper lip rotundate, apiculate, flat, lat. segm. broad, tipped with short straight awn, lowest pair long, sharp, curved upwards; cor. slightly exceeding cal., upper lip pubescent on back, achenes oblong-ovoid, dull, pale brown.

Waste places and garden ground; very common. Fl. June–Aug.; purplish-pink.

Throughout Tropical Asia to Australia.

The scent of the bruised leaves is faintly sourly aromatic; they are used in medicine in cases of cough and catarrh.

3. **O. adscendens,** *Willd. Sp. Pl.* iii. 166 (1800).

Trim. Syst. Cat. Ceyl. 69. C. P. 3999.

Fl. B. Ind. iv. 609 (not given for Ceylon).

Annual, 6–12 in., branches wide-spreading, slender, slightly puberulous, l. small, ½–1 in., oblong, tapering to base, obtuse,

---

* This is the 'Tulasi' or 'Tulsi' plant worshipped by the Hindoos throughout India, especially by Vishnuites.

faintly serrate, glabrous, much gland-dotted, petiole short, puberulous; whorls distant, few, bracts deciduous, racemes short, upper cal.-segm. obovate, rounded, 4 lower connate into a lower lip, ciliate, and with 2 sharp spinous teeth in centre; achenes globose, smooth, pale brown.

Dry country; very rare. The C. P. specimens are from Trincomalie (Glenie), and I have seen no others. Fl. Dec., Jan.; 'pale rose.'

Also in Peninsular India.

In Journ. Bot. xxiii. 140 I referred this to *O. aristatum*, Bl.; the specimens are very poor.

4. ***O. gratissimum,** *L. Sp. Pl.* 1197 (1753). **Gas-tala, Otala,** *S.*

Burm. Thes. 174. Moon Cat. 44. Thw. Enum. 236. C. P. 2062.
Fl. B. Ind. iv. 608. Burm. Thes. t. 80, f. 1.

Perennial, semi-shrubby, stems 4–6 ft., often woody below, much branched, sub-quadrangular, shortly hispid-pubescent; l. large, 4–6 in., lanceolate, tapering to both ends, acute, coarsely crenate-serrate, pubescent on both sides, thin, gland-dotted; racemes rather short, pubescent, with short purplish hair, bracts very broad, acuminate, decussate and squarrose in young infl.; cal. pubescent and with sessile glands, upper segm. broadly ovate, acute, lat. ones short, spreading, spinous-subulate, 2 lower ones much shorter than upper, connate to near the top, much curved upwards, and closing the mouth in fruit; cor. pubescent outside; achenes globose, rugose, dark brown.

Var. β, **suave,** *Hk. f.* *O. suave,* Willd., Thw. Enum. 236. C. P. 3623.

L. and infl. finely tomentose.

Waste ground and roadsides; a very common weed. Var. β, Ambagamuwa. Fl. June–Sept.; pale greenish-yellow.

India, Java, Trop. Africa, Trop. America, but doubtful where native.

The leaves when bruised give a faintly aromatic and apple-like scent; they are used in medicinal fumigations. Probably a naturalised plant here.

2. GENIOSPORUM, *Wall.*

Herbs, fl. very small, whorls many-flowered, in long, spicate, terminal infl.; cal.-tube tubular or ovoid, upper segm. flat, broad, obtuse, lat. ones triangular, acute, lower ones subulate; cor.-tube short, upper lip shortly 4-lobed, lower lip entire; stam. exserted; achenes minute, smooth.—Sp. 6; 3 in *Fl. B. Ind.*

Bracts large, white, fl. sessile . . . 1. G. ELONGATUM.
Bracts small, green, fl. on long ped. . . 2. G. PROSTRATUM.

1. **G. elongatum,** *Benth. Lab.* 21 (1832).
Rhinanthus indica, Burm. Fl. Ind. 131 (?) (non L.). Thw. Enum. 236. C. P. 2080.
Fl. B. Ind. iv. 610. Burm. f. Fl. Ind. t. 39, f. 1 (?).

Perennial (?), stems 2–4 ft., erect or ascending, usually unbranched, quadrangular, slightly hispid-pubescent; l. few, nearly sessile, distant, 1½–2½ in., linear-lanceolate, much tapering to base, acute or subacute, serrate, hairy on both sides; fl. numerous, crowded, sessile, whorls many, the lower ones distinct, the upper ones closely placed, forming a long-stalked, narrow, cylindrical, spicate infl. 3–6 in. long and often branched at the base, bracts large, conspicuous, often recurved, very broadly ovate, upper ones rounded, lower ones acute and often with a leafy point, entire, pubescent, veined, white, persistent; cal.-segm. hairy, upper segm. large, oval, flat, obtuse, glabrous, veined, longer than lowest pair.

Montane zone, on patana land from 3000–6000 ft.; rather rare. Hantane; Pusselawe; Nuwara Eliya; abundant on the Uva patanas. Fl. October–March; pink.

Also in Peninsular India (Jeypur Hills).

The large white bracts are very characteristic; they are entirely omitted in Burman's figure, which has also the fl. on ped., and I should certainly refer his plant (as I did in Journ. Linn. Soc. xxiv. 145) to *G. elongatum* were it not that Bentham, who saw the type-specimen, found it to be the present species. It is difficult, however, to understand how Hermann could have obtained this montane plant; it is not in his own Herbarium.

2. **G. prostratum,** *Benth. in Pl. As. Rar.* ii. 18 (1831).
Burm. Thes. 158. Fl. Zeyl. n. 229. *Ocimum tenuiflorum*, L. Sp. Pl. 597, and *O. menthoides*, 598. Thw. Enum. 237. C. P. 2079.
Fl. B. Ind. iv. 610. Burm. Thes. t. 70, f. 2 (very good).

Annual, stems either diffuse, ascending, prostrate and rooting or quite erect, much branched, more or less hispid with weak deflexed hair; l. 1–2 in., linear- or oblong-lanceolate, much tapering to base, acute or subacute, usually sharply serrate, with a few long hairs on both sides, petiole obscure; fl. on rather long slender curved ped., whorls distinct, in slender racemes 2–6 in. long, bracts small, ovate, acute, reflexed; cal. pubescent, upper segm. broad, rounded, flat, about as long as or rather shorter than lowest pair; cor. hairy; achenes very minute, nearly globose, smooth.

Var. β, **gracile,** *Thw. Enum.* 237. *G. gracile*, Benth. Lab. 21. C. P. 2078.

Nearly glabrous; l. narrower.

Sandy ground, especially near the sea, and in the dry region, common. Fl. Dec.–March; pink.

Also in S. India.

Burmann's figure well represents the small erect form so abundant on the seashore in many places; this passes into the usual state. The flowers are occasionally white. Var. β is a slight and inconstant form.

3. MOSCHOSMA, *Reichenb.*

Annual, fl. very small, whorls about 6-fld., secund, racemes small, dense, numerous, bracts inconspicuous; cal. campanulate, segm. short, upper one broad, obtuse, lat. ones triangular acute, lower two narrowly triangular, mucronate; cor. minute, upper lip 4-lobed, lower lip entire; stam. included, fil. distinct, anth.-cells confluent; achenes broadly ovoid, smooth.—Sp. 6; 1 in *Fl. B. Ind.*

M. polystachyum, *Benth. in Wall. Pl. As. Rar.* ii. 13 (1831).
Ocimum polystachyon, L., Moon Cat. 44. Thw. Enum. 237. C. P. 2056.
Fl. B. Ind. iv. 612.

Stem 2–3 ft., erect, much branched, sharply quadrangular, glabrous, l. 1–2 in., ovate, tapering to base, acuminate, obtuse, apiculate, irregularly crenate-serrate, glabrous, very thin, petiole as long as l., very slender; fl. on short ped., whorls numerous, closely placed to form small slender shortly stalked spicate racemes 1–2 in. long and arranged in large panicles; cal.-tube pubescent, limb glabrous, membranous, veined; achenes dark brown.

Low country, especially in the dry region; rather rare. Kurunegala; Bintenne, &c. Fl. pink.
In most parts of Tropics of Old World.

4. ORTHOSIPHON, *Benth.*

Perennial, fl. moderate-sized, whorls usually 6-fld., distant, racemes lax, terminal; cal. oblong-ovoid, upper segm. broad, ovate, lat. ones triangular, acuminate, lower ones longer, shortly connate, subulate; cor.-tube slender, straight, upper lip deeply 3-lobed, lower lip entire; stam. included; achenes ovoid, minutely tubercled, in much-enlarged cal.—Sp. 16; 9 in *Fl. B. Ind.*

O. glabratus, *Benth. in Wall. Pl. As. Rar.* ii. 14 (1831).
Benth. in DC. Prod. xii. 50. Thw. Enum. 237. C. P. 2059.
Fl. B. Ind. iv. 614 (*O. tomentosus*, var.).

Stems 1–2 ft., rather slender, often semi-woody at base, slender, branched, sharply quadrangular, glabrous or very slightly pubescent; l. small, 1–1¾ in., ovate or oblong-ovate, acute at both ends, coarsely serrate, glabrous above, often

minutely pubescent on veins beneath, petiole variable in length, slender; fl. on slender spreading ped., bracts ovate, acute, shorter than ped.; cal. nearly glabrous, membranous, veiny, upper segm. erect, acute; cor. rather variable in size, pubescent outside, lobes oblong, obtuse.

Shady places in the dry region; rather common. Fl. Jan.–April; very pale purple.

Also in S. India.

This is made a variety of *O. tomentosus*, Benth., of S. India, in Fl. B. Ind., and probably rightly so. Our plant is always quite glabrous.

[*O. diffusus*, Benth., is quoted with doubt for Ceylon, Walker, in Fl. B. Ind. iv. 613. The specimens were probably collected in Southern India.]

5. **PLECTRANTHUS,** *L'Herit.*

Perennial herbs, fl. small, in lax opp. cymes (whorls) in racemes or panicles; cal. enlarged in fruit. segm. 5, all nearly equal or forming 2 lips; cor.-tube long or short, straight or deflexed, limb 2-lipped, upper lip short, usually 4-lobed, lower lip long, entire, boat-shaped; stam. 4, fil. distant, cells confluent, disk often prominent in front; style bifid; achenes smooth or nearly so.—Sp. 80; 32 in *Fl. B. Ind.*

Fruiting-cal. 2-lipped, upper lip of 3, lower of 2 segm.
- L. oval-ovate . . . . 1. P. NIGRESCENS.
- L. narrowly lanceolate . . . . 2. P. WALKERI.

Fruiting-cal. 2-lipped, upper lip entire, lower of 4 segm.
- Stam. much exserted . . . . 3. P. GARDNERI.
- Stam. included . . . . 4. P. COLEOIDES.

Fruiting-cal. not 2-lipped. segm. nearly equal.
- L. hairy beneath . . . . 5. P. CAPILLIPES.
- L. white-tomentose beneath . . . . . 6. P. MENTHOIDES.

1. **P. nigrescens,** *Benth. Lab.* 710 (1832).

P. hians, Benth. in DC. Prod. xii. 57. *P. scabrellus*, Benth. l. c. 58. Thw. Enum. 237 (part). C. P. 425.

Fl. B. Ind. iv. 617.

Stem $1\frac{1}{2}$–2 ft., erect, slightly branched, bluntly quadrangular, finely or coarsely pubescent; l. $1\frac{1}{2}$–3 in., oval-ovate, obtuse at both ends, coarsely serrate-crenate, hairy on both sides, thin, somewhat rugose, with prominent veins and often purple beneath, petiole $\frac{1}{2}$–$1\frac{1}{4}$ in.; fl. on rather long glandular pilose ped., cymes lax, shortly stalked, whorls distant in much elongated terminal racemes, bracts very small, leafy; cal. inflated, curved, pubescent deeply 2-lipped, upper lip erect, flat, with 3 short triangular teeth, lower lip shorter, with 2

short oval obtuse teeth; cor.-tube short, lips nearly equal; stam. exserted, achenes white, smooth and shining.

Forests of the montane zone, 4000–7000 ft.; common. Fl. February, Sept., &c.; pink.

Endemic (?).

Variable in form and pubescence of leaves. Dries blackish.

2. **P. Walkeri,** *Arn. Pug.* 36 (1836).

Benth. in DC. Prod. xii. 58. *P. nigrescens,* Thw. Enum. 237 (part). C. P. 90.

Fl. B. Ind. iv. 617.

Stems bluntly quadrangular, slightly branched, pubescent, l. numerous, 2–3 in., lanceolate or linear-lanceolate, much tapering to base, subacute, upper part very coarsely dentate-serrate, nearly glabrous or often pubescent on the veins, petioles $\frac{1}{2}$–$1\frac{1}{2}$ in.; fl. as in *P. nigrescens.*

Sides of streams in forests of montane zone, 4000–7000 ft.; rather common. Fl. Feb.; pink.

Also in S. India.

I follow Fl. B. Ind. in keeping this distinct from *P. nigrescens;* I should prefer to make it a variety. Thwaites combined them. Also dries blackish.

3. **P. Gardneri,** *Thw. Enum.* 237 (1860).

C. P. 16.

Fl. B. Ind. iv. 622 (*P. subincisus,* Benth., var.).

Small, stems branched below, stout, succulent, very bluntly quadrangular, pubescent with short purple hair; l. 1–2 in., rhomboid-ovate, obtuse, coarsely often doubly crenate, hairy on both sides, paler with prominent purplish venation beneath, petiole $\frac{1}{4}$–1 in; fl. pedicellate, 2–4 in a whorl, racemes erect, slender, lax, finely pubescent, terminal and axillary; cal. pubescent, upper lip erect, rotundate, obtuse, entire, lower lip of narrowly triangular acute teeth, the two lowest the longest; cor. pubescent outside, tube as long as cal., upper lip large, arched, 4-lobed, with the 2 upper lobes the largest, lower lip small, deflexed, rounded, concave; stam. much exserted, anth. very small; achene subglobose, white.

Damp forests of upper montane zone; very common, Fl. September, March, April; pale pink.

Endemic.

This is made a variety of *P. subincisus,* Benth., of S. India in Fl. B. Ind.

P. subincisus, Benth., itself is recorded from Ceylon in DC. Prod. xii. 66 on the authority of Macrae. There is also an unlocalised poor specimen (C. P. 2890) in Herb. Perad. alluded to in Thw. Enum. 237. It has the leaf cordate at base.

P. zeylanicus, Benth. (originally described from a specimen sent from Ceylon by Macræ), is the 'Iri-wériya' of the Sinhalese, and grown in

native gardens as a medicine for bowel complaints. It is C. P. 2083, but is not a wild plant in Ceylon. It does not appear to differ materially from *P. parviflorus*, Willd., of the Pacific Is. and Australia, figured (*P. australis*, Br.) in Bot. Reg. t. 1098, save in its smaller and paler flowers. The leaves are very sweet-scented when bruised, with much of the scent of the 'Verbena' of gardens (*Lippia citriodora*), and the flowers pale blue.

4. **P. coleoides,** *Benth. in DC. Prod.* xii. 64 (1848).
Coleus Wightii, Benth., Trim. Syst. Cat. Ceyl. 70. C. P. 3942.
Fl. B. Ind. iv. 622 (not given for Ceylon). Wight, Ic. t. 1433 (*Coleus Wightii*). Bot. Mag. t. 5841.

Stem about 2 ft., stout, succulent, obscurely quadrangular, glabrous; l. 2–3 in., broadly ovate, cordate at base, obtuse, irregularly crenate, hairy on both sides, petiole ½–2 in.; fl. rather large, on densely glandular pubescent ped., cymes lax, stalked, racemose, combined in an elongated lax very glandular-pubescent panicle, bracts deciduous; cal. small but much enlarged in fruit, glandular-pubescent, upper lip broad, oval, obtuse, lower lip of 4 linear-lanceolate, subulate-tipped segm.; cor. glandular-pubescent outside, tube much deflexed, much longer than cal., lower lip ovate, long; stam. included; achenes smooth, shining.

Upper montane zone; very rare. Above Hakgala, 1867. Fl. Jan., Feb.; pale violet-purple.
Also in mountains of S. India.
I have not met with this.

5. **P. capillipes,** *Benth. in DC. Prod.* xii. 57 (1848).
Thw. Enum. 237. C. P. 2064.
Fl. B. Ind. iv. 619.

Stem 1–2 ft., very erect, unbranched, bluntly quadrangular, sparingly pubescent; l. few, mostly near base of stem, 1–1¾ in., broadly ovate, truncate or rounded at base, acute, coarsely crenate-dentate, hairy on both sides, petiole ¼–¾ in., upper l. smaller, sessile, passing into bracts; fl. small, numerous, on long, very slender, minutely glandular-pubescent ped., cymes lax, spreading, on branches of large narrowly pyramidal panicles; cal. scabrous, slightly curved, segm. nearly equal, short, triangular, subacute; cor.-tube rather long, lobes of upper lip short, rounded; stam. exserted; achenes oblong-ovoid, slightly rough.

Lower montane zone, 3000–5000 ft.; rather rare. Hantane; Ramboda. Fl. September, October; white tinged with pink.
Endemic.

6. **P. menthoides,** *Benth. in Wall. Pl. As. Rar.* ii. 17 (1831).
P. Macræi, Benth. Lab. 42. *P. Coetsa*, Thw. Enum. 237 (? Don). C. P. 2063.
Fl. B. Ind. iv. 620. Wight, Ic. t. 1430.

A large perennial herb, semi-shrubby at base, stems 2–4 ft., erect, stiff, stout, quadrangular, tomentose-pubescent, much branched above; l. 2–3½ in., ovate, rounded at base but somewhat decurrent on petiole, acute, coarsely dentate-serrate, softly pubescent and somewhat rugose above, tomentose-pubescent and white beneath with very prominent venation, petiole stout, woolly; fl. very small and numerous, on slender deflexed pubescent ped.; cymes short, numerous, whorls in long, secund, narrow, axillary, and terminal racemose panicles; cal.-tube cylindrical, curved upwards, hairy, segm. equal, triangular, acute, much shorter than tube; cor.-tube deflexed, upper lip erect, much shorter than tube, lobes rounded, lower lip boat-shaped, pubescent outside; achenes very small, oblong-ovoid, smooth, pale brown.

Open places in the montane zone, 4000–6000 ft.; rather common. Fl. Nov.–April; pale violet.

Also in Southern India.

Scarcely distinct from the Himalayan *P. Coetsa*, Don, with which Thwaites unites it. Strongly scented.

6. **COLEUS,** *Lour.*

Scarcely distinct from *Plectranthus*, but the fil. more or less connate at the base into a sheath surrounding the style.—Sp. 50; 8 in *Fl. B. Ind.*

Fruiting-cal. 2-lipped, upper lip of 1, lower of 4 segm.
  Fl. in whorls forming spikes . . . . . 1. C. BARBATUS.
  Fl. in racemose cymes forming panicles.
    Lower lip of cor. longer than upper. . . 2. C. MALABARICUS.
    Lower lip of cor. shorter than upper . . 3. C. INFLATUS.
Fruiting-cal. not 2-lipped, segm. nearly equal . 4. C. ELONGATUS.

1. **C. barbatus,** *Benth. in Wall. Pl. As. Rar.* ii. 15 (1831). **Wal-kapura-walliya,** *S.*

Plectranthus elongata, Moon Cat. 44. Thw. Enum. 238. C. P. 2069. Fl. B. Ind. iv. 625. Wight, Ic. t. 1432. Bot. Mag. t. 2318 (*Plectranthus comosus*).

Stem ascending, slightly branched, stout, cylindrical, shortly pubescent, and with a few long glandular hairs; l. 1½–2½ in., oblong-oval, very obtuse, coarsely crenate-serrate, pubescent on both sides, rather thick, venation reticulate, prominent above, impressed beneath; fl. large, about 10 in a whorl, on short, glandular, stiffly decurved ped., whorls distinct, dense, racemes spicate, 6–9 in., erect, rachis densely glandular-hairy, bracts large, very conspicuous, imbricate before flowering, ovate, acuminate, pubescent and ciliate,

soon falling; cal. with long white hair outside, upper lip ovate, acute, lower lip with 4 straight, narrowly triangular, very acute, ciliate segm. about as long as upper lip; cor.-tube very short, compressed, upper lip of 4 very small, shallow, erect lobes, lower lip large, ½ in., stalked, boat-shaped, first deflexed then horizontal, hairy outside, acute; stam. declinate; fruiting cal. considerably enlarged, upper lip cuspidate, veiny, decurrent on tube, erect, mouth with a dense tuft of white woolly hair above; achenes globular-compressed, black, shining.

Low country, in exposed rocky places up to 5000 ft.; rather common. Hantane; Dambulla; Galagama; Palagama, and other places in Uva, locally abundant. Fl. April, August; rich purple.

A desirable plant for cultivation; fl. occasionally white, scent aromatic, but not very agreeable.

C. parviflorus, Benth. (*Plectranthus tuberosus*, Bl., Thw. Enum. 238), is cultivated for its edible tubers, known as 'Innala,' or 'Country Potato.' It is C. P. 2068, but is not a native. It is given in Moon Cat. 43 as *Nepeta madagascariensis*, Lam., and is well figured (but without fl.) in Rheede, Hort. Mal. t. 25 under the name 'Kurka.' The figure in Rumph. Herb. Amboin. v. t. 132, f. 1, seems to be the same, and Ceylon may have got the plant from Malaya. *Plectranthus ternatus*, Bot. Mag. t. 2460 (from Madagascar originally) is probably the same. The fl. are pale violet, and the leaves succulent and lemon-scented.

C. aromaticus, Benth., is cultivated in native gardens under the name 'Kapura-walliya,' and is C. P. 3971 from Dambulla Hill, where is a large patch in a semi-wild state. It is much employed as a medicine, especially for cattle, and a plant is always to be found growing in a little box suspended on the side of the native carts. Hermann mentions the plant (Mus. 62), and there is a fairly good figure in Bot. Reg. t. 1520. If this be the original *C. amboinicus* of Loureiro, as seems probable, the plant should take that earlier name. The English in India call this 'Borage' (to which it has very little resemblance), from its use in cool tankards, &c.

2. **C. malabaricus,** *Benth. in Wall. Pl. As. Rar.* ii. 16 (1831).
C. Macræi, Benth. Lab. 58. *C. Walkeri*, Benth. in DC. Prod. xii. 77. *C. mollis*, Benth. l. c. 77. Thw. Enum. 238. C. P. 2066, 2995, 3435 (=17 part).
Fl. B. Ind. iv. 626. Bot. Mag. t. 4690 (*C. Macræi.*)

Stem 2–3 ft., stout, succulent, quadrangular, glabrous or pubescent; l. 3–6 in. (or more), ovate-oval, acute or obtuse at base, acuminate, obtuse, shallowly crenate-serrate, glabrous or pubescent, petiole long, 2–4 in., fl. rather large, on short glabrous or pubescent ped., cymes racemose, bifurcate, shortly stalked, in broad terminal panicles, bracts large, ovate, acute, deciduous; cal. small, but greatly enlarged in fruit, upper lip broadly oval, acute, lower lip with lat. segm. short, broadly triangular, mucronate, and 2 lowest lanceolate, long, mucronate;

cor.-tube $\frac{3}{4}$ in., abruptly bent at right angles below the dilated laterally compressed upper portion, glabrous, upper lip very slightly 4-lobed, lower lip longer, shortly stalked, oval, acute, boat-shaped; stam. slightly exserted; achenes ovoid, rather compressed, somewhat ribbed, shining, dark brown.

Var. β, **leptostachys,** *Hk. f.* *C. leptostachys*, Benth. in DC. Prod. xii. 77 C. P. 17 (part).

L. narrow; fl. smaller.

Forests of the moist region; in the montane zone (3000–6000 ft.), common, rarer in the low country. Fl. Feb., Mar., and Sept., Oct.; very pale violet or nearly white, upper lip darker.

Also in mountains of S. India.

A very variable plant, but the species proposed by Bentham are not bounded by constant characters. The cal. and the whole of the inflorescence, as well as the under surfaces of the leaves, are often a deep coppery purple.

3. **C. inflatus,** *Benth. Lab.* 58 (1832).

C. Benthamianus, Arn. Pug. 36; Benth. in DC. Prod. xii. 77. Thw. Enum. 238. C. P. 2065.

Fl. B. Ind. iv. 626. Bot. Mag. t. 5236 (not good).

Stem 2–4 ft. or more, very stout, succulent, acutely quadrangular or winged, glabrous and shining but for a transverse line of hair at the nodes, spotted or stained with purple; l. large, 4–7 in., oval, tapering to base, acuminate, acute, serrate, hairy on both sides, thin, veins prominent beneath, petiole 2–3 in., stout, pubescent, usually purple; fl. rather large, on short, slender, glabrous ped., cymes racemose, small, horizontal, in long lax narrow pyramidal terminal panicles, bracts caducous, rachis pubescent, purple; cal. small but very much enlarged in fruit, slightly pubescent, 2-lipped, upper lip ovate, acute, curved upward, lower shorter with lat. segm. triangular, acute, and two lowest longer acuminate; cor.-tube $\frac{7}{8}$ in. narrow, doubly curved, glabrous, lips very short, upper flat, 3- or 4-lobed, lower acute; stam. slightly exserted; achenes ovoid, polished, brown.

Forests of the montane zone above 5000 ft., common. Fl. Sept.–Feb.; pale pinkish-violet, cal. dull pink.

Endemic.

The inflorescence is vinous red and the stems and petioles often also red with darker spots. A conspicuous plant in the hill jungles.

4. **C. elongatus,** *Trim. in Journ. Bot.* xxvii. 165 (1889). [PLATE LXXIV.]

Stems 2–3 ft., weak, straggling, sharply quadrangular (not winged), rather succulent, finely puberulous, with long spreading divaricate branches; l. small, 1–1$\frac{3}{4}$ in., ovate-triangular,

rather truncate at base, subacuminate, coarsely crenate-serrate, very finely pubescent, thin, pale green, veins prominent beneath, petioles rather long, pubescent; fl. very small, on short pubescent opp. ped., closely placed in short, slender, secund, distant divaricate opp. stalked racemes 1–1½ in. long from axils of fallen l., bracts small, about as long as ped.; cal. very much curved, hispid with short stiff hair, glabrous within, segm. nearly equal, linear-lanceolate, acuminate, the 2 lowest rather longer and narrower; cor. ⅜ in., hairy with short stiff hair outside, glabrous within, tube nearly straight, gibbous at base, dilated upwards, upper lip short, reflexed, 4-lobed, the 2 middle lobes largest, lower lip as long as tube, entire, strongly curved upwards; achenes not seen.

Very rare. Only found near the summit of Ritigala Hill, North-central Prov., at about 2500 ft., trailing over rocks. Fl. July; bright pale purple.

Endemic.

The leaves fall very quickly; they are slightly aromatic, very bitter. The numerous short narrow racemes on the bare stems give this a very characteristic appearance.

7. **ANISOCHILUS,** *Wall.*

Annual or perennial, often semi-shrubby, fl. small, sessile, in dense short terminal spikes; cal. somewhat inflated, small, 2-lipped, upper lip large, entire, deflexed and usually covering the mouth in fruit, lower lip very short, truncate, obscurely toothed or 0; cor.-tube short, decurved, inflated at throat, upper lip short, 3- or 4-lobed, lower lip long; stam. exserted or not, fil. distinct, anth.-cells confluent, style bifid; achenes smooth.—Sp. about 16; 13 in *Fl. B. Ind.*

Annual; spikes over ½ in. . . . 1. A. CARNOSUS.
Perennial; spikes under ½ in.
  L. broadly ovate, harshly pubescent . 2. A. PANICULATUS.
  L. oblong or lanceolate, velvety . . 3. A. VELUTINUS.

1. **A. carnosus,** *Wall. Pl. As. Rar.* ii. 18 (1831). **Gal-kapura-walliya,** *S.*

Lavandula carnosa, L. f., Moon Cat. 44. Thw. Enum. 238. C. P. 2055. Fl. B. Ind. iv. 627. Rheede, Hort. Malab. x. t. 90. Wight, Ill. t. 1766, f. 1.

Annual, stem 1–2 ft., erect, stiff, slightly branched, bluntly quadrangular, glabrous or very finely pubescent; l. rather small, 1–2 in., broadly oval, rounded or subcordate at base, very obtuse, crenate-dentate, glabrous above, slightly pubescent beneath, rather fleshy, petiole ½–1 in.; spikes ½–1 in.

(becoming 2 in. in fruit), oblong-ovoid, tapering, terminating spreading branches of infl.; cal. finely pubescent, glandular, upper lip very large, triangular-lanceolate, acute, strongly deflexed, slightly ciliate; achenes very small, ovoid, compressed, dark brown, polished.

Exposed rocks in low country, rare. Four Korales Dist. (Moon.); Dambulla, abundant. Fl. March; pale violet.

Also in India and Burma.

2. **A. paniculatus,** *Benth. in DC. Prod.* xii. 82 (1848). [PLATE LXXV.]

Thw. Enum. 238.

Fl. B. Ind. iv. 628.

Semi-shrubby, stem 1½–2 ft., stout, very bluntly quadrangular, slightly branched, scabrous-pubescent, young parts tomentose; l. 1½–2½ in., broadly oval or rotundate, rounded at both ends, coarsely crenate, densely and harshly pubescent on both sides, rather thick, petiole ½ in., spikes small, ½ in. or less, globose or ovoid, on long divaricate tomentose branches of lax broadly pyramidal paniculate infl.; upper lip of cal. very large, broadly oval, obtuse, strongly ciliate, deflexed; lower cor.-lip hairy and glandular outside.

Exposed rocks in the low country, very rare. I have only seen it at Bellongala, Kaduganawa, at an elevation of about 2500 ft. Fl. August; white.

Also in Mysore.

Originally described from a specimen of Walker's (n. 51) in Herb. Kew., without special locality. The glands on the back of the corolla are granular and of a brilliant orange colour.

3. **A. velutinus,** *Trim.* **Bolvila, Bolila,** *S.*

A. suffruticosus, Thw. Enum. 238; Trim. Syst. Cat. Ceyl. 70 (non Wight). C. P. 3573.

Semi-shrubby, about 2 ft., dichotomously branched, very bluntly quadrangular, succulent, very finely and softly pubescent, marked with l.-scars; l. 1–3 in., oblong-oval or lanceolate, acute at base, obtuse at apex, sharply crenate, finely velvety-pubescent, petiole ½–1 in.; spikes small, about ½ in. in fruit, oblong-ovoid on divaricate pubescent branches of broad corymbose-paniculate infl.; cal. very pubescent, upper lip broad, rounded, hooded, obtuse, sometimes apiculate, lower lip obsolete; cor. with copious crisp hair and sessile red glands outside, tube exserted, lower lip oblong, obtuse; achenes ovoid, dull, pale yellowish-brown.

On bare rocks in the dry country, rather rare. Gunner's Quoin, Batticaloa Dist. (Thwaites); E. Bintenne (Nevill); near Kurunegala; Nilgala, Uva. Fl. Jan.–March, July.

Endemic.

Mr. Nevill informs me that this plant is used as a masticatory by the Veddas. This is the species referred to at Fl. B. Ind. iv. 630. It differs from *A. suffruticosus*, Wight, figured in Wight, Ic. t. 1437, in its short heads, velvety (not villous) leaves and other points.

8. POGOSTEMON, *Desf.*

Perennial, often shrubby, fl. small, in fascicles or cymes, whorls in terminal spicate infl.; cal.-segm. 5, equal, very acute; cor.-tube usually rather short, upper lip 3-lobed, lower lip entire; stam. 4, very much exserted, usually bearded with long hair, anth.-cells confluent; style bifid.—Sp. 30; 25 in *Fl. B. Ind.*

Fil. with long hair.
  L. over 2 in. . . . . 1. P. HEYNEANUS.
  L. under 2 in.
    Infl. lax, elongated . . . 2. P. RUPESTRIS.
    Infl. dense, short . . . 3. P. HIRSUTUS.
Fil. glabrous . . . . . 4. P. REFLEXUS.

1. **P. Heyneanus,** *Benth. in Wall. Pl. As. Rar.* i. 31 (1830). **Gan-kollan-kola,** *S.*

Herm. Mus. 35. Fl. Zeyl. n. 228. *Ocimum frutescens*, L. Sp. Pl. 597. *Mentha perilloides*, L. Syst. Veg. ed. 13, 736; Moon Cat. 44. Thw. Enum. 239. C. P. 33.

Fl. B. Ind. iv. 633 (*P. Patchouli*, Pell.). Wight, Ic. t. 1440. Rheede, Hort. Mal. x. t. 77.

A large straggling undershrub, often semi-scandent by its long horizontal branches, stems very bluntly quadrangular or nearly cylindrical, swollen above the nodes, glabrous, the younger ones adpressed-pubescent; l. large, 2–5 in., rhomboid-ovate, more or less tapering to base and narrowly decurrent on petiole, acuminate, acute, coarsely and very irregularly crenate-serrate except at lower part, slightly hairy on both sides, thin, paler beneath, venation pellucid, prominent beneath, petiole long, 1–3 in.; fl. numerous, sessile, fascicles small, dense, secund, whorls globose, spike narrow, interrupted, bracts small, one to each flower shorter than cal. and a larger one at base of fascicle, ovate, glandular-pubescent; cal. ovoid, segm. narrowly triangular, acute, connivent, glandular-pubescent; cor.-tube slightly longer than cal., lobes oval, acute, recurved; fil. with copious long hairs.

Moist region, up to 6000 ft., common, especially in the montane zone. Fl. April, May; fl. white, fil. and hairs pale pinkish-violet.

Linnæus much confused himself over this plant by following Burmann, who confounded it with *Ocimum gratissimum.* (See also my note in Journ. Linn. Soc. xxiv. 145.)

Sir J. Hooker, in Fl. B. Ind., refers this with certainty to *P. Patchouli*,

Pell. It is never cultivated here, and, though the leaves have a faint pleasant scent, it is not like that of *P. Patchouli;** the habit is also quite unlike and the leaves are very different in form.

The powdered dry leaves are used as a cephalic snuff in native medicine.

2. **P. rupestris,** *Benth. Lab.* 156 (1832).
Thw. Enum. 239.
Fl. B. Ind. iv. 634.

Stems slender, often decumbent below, quadrangular, branched, glabrous or slightly hairy; l. $\frac{1}{2}$–2 in., petiolate, ovate-lanceolate, slightly acuminate, obtuse, coarsely crenate-serrate, glabrous or hairy on veins beneath; fl. on short glabrous or hairy ped., cymes small, lax, whorls forming an elongated lax infl., bracts linear; cal. glabrous or somewhat bristly, segm. narrowly triangular, short, acute; cor. very small; fil. with long hair.

Forests of upper montane zone, common. Fl. Feb.; pink.
Endemic.

3. **P. hirsutus,** *Benth. Lab.* 155 (1832).
P. rupestris, var, Thw. Enum. 239. C. P. 283, 343 (part).
Fl. B. Ind. iv. 635.

Stems often prostrate and rooting at base, 1–2 ft., branched, quadrangular or compressed, more or less pubescent, l. $\frac{1}{2}$–2 in., petiolate, ovate-lanceolate, subacute, serrate, slightly pubescent on both sides; fl. on very short ped., whorls closely placed, forming a short dense infl.; cal. hispid with long hair, segm. with a prolonged ciliate filiform tip; fil. with long hair.

Forests of upper montane zone, very common. Fl. Jan.–March; pink.
Endemic.

I have followed Fl. B. Ind. in keeping this as distinct, but find many specimens quite intermediate between it and *P. rupestris*, and impossible to refer definitely to either.

4. **P. reflexus,** *Benth. in DC. Prod.* xii. 155 (1848).
Thw. Enum. 239. C. P. 154.
Fl. B. Ind. iv. 637.

Semi-shrubby, stems 2–4 ft., much branched, stout, obscurely quadrangular, densely set with reflexed hair; l. 1$\frac{1}{2}$–3 in., ovate, rounded or cordate at base, slightly acuminate, obtuse, unequally crenate-serrate, sparingly hairy above, more so beneath; petiole $\frac{1}{2}$–1$\frac{1}{2}$ in., hairy; fl. numerous, on short ped., cymes small, deflexed or spreading, whorls

---

* A figure of the true Patchouli plant (*P. suavis*) in flower is given in Kew Journ. Bot. i. t. 11, made from a plant which flowered at Kew in 1849.

crowded to form a dense elongated infl. 3–4 in. long at first and lengthening out to 7–10 in. in fruit, rachis with long spreading hair, bracts linear; cal. over $\frac{1}{4}$ in., densely covered with spreading hair, segm. linear-triangular, very acuminate; cor.-tube narrowed below, slightly exserted, hairy outside; fil. very long, $\frac{1}{3}$ in., not hairy; achenes small, black, with sessile white glands.

Exposed rocky places in montane zone, 3000–6000 ft., rather rare. Adam's Peak; Dolosbagie; above Warriagala, Hantane. Fl. Feb., March; greenish-pink, cal. purple.

Endemic.

A handsome species.

9. **DYSOPHYLLA,** *Bl.*

Annuals, l. opp. or whorled, fl. minute, whorls fused in very dense spicate infl., cal. with 5 equal segm., throat naked; cor.-tube short, lobes 4, equal; stam. 4, exserted, fil. bearded, anth.-cells confluent; style bifid; achenes minute, smooth.—Sp. about 20; 17 in *Fl. B. Ind.*

L. opp., oval, hairy	1. D. AURICULARIA.
L. whorled, linear, glabrous . .	2. D. VERTICILLATA.

1. **D. auricularia,** *Bl. Bijd.* 826 (1826). **Hemanilla,** *S.*
Herm. Mus. 29. Burm. Thes. 228. Fl. Zeyl. n. 411. *Mentha auricularia*, L. Mant. 81. Moon Cat. 44. Thw. Enum. 239. C. P. 26.
Fl. B. Ind. iv. 638. Wight, Ic. t. 1445.

Stems 1–2 ft., erect, with many long branches, quadrangular, densely covered with long coarse spreading hair; l. opp., very shortly petioled, 1–2 in., oval or oblong-oval, rounded at base, subacute, serrate, hairy on both sides; fl. nearly sessile, whorls small, dense, spike narrow cylindrical, terminal, 2–4 in., bracts ovate, acute, hairy, strongly ciliate; cal. with long hair, segm. oblong, acute, cor.-tube slightly exserted, lobes lanceolate, acute, fil. with a tuft of long hairs.

Wet places, borders of paddy fields, &c., in moist low country; common. Fl. Dec.–Feb.; pale lilac.

Also in India, S. China, Borneo, and Philippine Is.

2. **D. verticillata,** *Benth. in Wall. Pl. As. Rar.* i. 30 (1830).
Thw. Enum. 239. C. P. 2082.
Fl. B. Ind. iv. 639.

Stems 1–2 ft., erect, cylindrical, succulent, much branched, glabrous; l. 4–8 in a whorl, sessile, $1\frac{1}{2}$–3 in., narrowly linear, very acute, sharply serrate, glabrous, spreading; fl. sessile, closely packed, whorls fused, spike 1–2 in., narrow, cylindrical, terminal, bracts inconspicuous; cal. pubescent or tomentose, segm. triangular, acute, spreading stellately in fruit.

Dry region, in wet places; rather rare. Sigiri; Bintenne; Batticaloa. Fl. Feb., March.

Also in Bengal, Burma, Malay Is., China, Australia.

10. **MENTHA,** *L.*

Perennial herb, fl. small, in axillary cymes, whorls distinct; cal. campanulate, segm. 5, equal; cor.-tube broad, slightly exserted, lobes 4, nearly equal; stam. 4, distinct, exserted, anth. 2-celled; achenes smooth.—Sp. about 25; 2 in *Fl. B. Ind.*

M. javanica, *Bl. Bijd.* 826 (1826). **Odu-talan,** *S.*

M. lanceolata, Benth. Lab. 181. *M. arvensis*, L., Thw. Enum. 239. C. P. 2077.

Fl. B. Ind. iv. 648 (*M. arvensis*, var.).

Stem 1–2 ft., quadrangular, finely and thinly pubescent, with long branches, l. 1½–2½ in., lanceolate, tapering into short petiole, acute, sharply serrate, sparsely pubescent above and on the veins beneath; fl. on slender ped., cymes shortly stalked, small, close, whorls distinct, all axillary, bracts narrowly lanceolate, acuminate; cal. hairy, segm. narrow, acuminate, shorter than tube; cor. glabrous, lobes long, oblong, obtuse, the upper one bilobed.

Moist region on borders of paddy fields; rather rare. Pusselawa (Gardner); Allagala (Thwaites); Gangarua, near Kandy. Fl. May; very pale violet.

Also in Malacca and Java.

I have not seen this in flower, but there are specimens in the Herbarium. Of European mints it comes nearest to *M. sativa*, L. It is not so much like *M. arvensis*. Has the scent of *M. viridis*, the spear-mint of gardens. An introduction (?). Not mentioned in Moon Cat.

M. sylvestris, L., var. *crispa*, Benth., frequently occurs by roadsides in the montane region as an escape from gardens. It very rarely flowers here.

11. **CALAMINTHA,** *Moench.*

Perennial herb, whorls few, close, capitate; cal.-tube long, 13-ribbed, 2-lipped, upper lip of 3 short triangular segm., lower lip of two longer subulate ones; upper lip of cor. erect, lower 3-lobed; stam. included under upper cor.-lip, anth.-cells distinct, becoming divaricate; achenes minute, smooth.—Sp. 40; 3 in *Fl. B. Ind.*

C. umbrosa, *Benth. in DC. Prod.* xii. 232 (1848).

C. Clinopodium, var. *umbrosa*, Hk. f. in Thw. Enum. 239. C. P. 2058.

Fl. B. Ind. iv. 650. Wight, Ic. t. 1447 (*Melissa umbrosa*).

Stems numerous, decumbent or ascending, slender, quadrangular, pubescent with deflexed silky hair; l. small, about ¾ in., on very short ped., ovate, rounded at base, subacute, coarsely crenate-serrate, slightly pubescent above, hairy on margins and veins beneath; fl. small, on short slender ped., in rather lax clusters, whorls few, closely placed so as to form a nearly globose head (lengthening out in fruit), bracts linear, longer than ped., hairy; cal.-glandular-hairy, segm. ciliate with long white hairs; cor. pubescent outside, lobes rounded.

Upper montane zone in grassy places; common about Nuwara Eliya, &c. Fl. Sept., Oct.; pink-mauve.

Also in the Himalaya and Nilgiri Mountains, and from the Caucasus to Japan.

Scarcely distinguishable from the *C. Clinopodium* of the English chalk-downs. Wight's figure represents a very robust specimen.

12. **SCUTELLARIA,** *L.*

Perennial herbs, fl. opp., solitary, in erect terminal racemes; cal. 2-lipped, lips rounded, quite entire, without segm., mouth closed in fruit, upper lip with a large erect pouch or sac on the back; cor.-tube long, abruptly curved at base, erect, compressed, slender, upper lip arched, compressed, slightly lobed, lower lip large, rounded, 3-lobed; stam. 4, nearly equal, anth. distinct, upper ones 2-celled, lower 1-celled; achenes small, finely granulated.—Sp. 90; 14 in *Fl. B. Ind.*

Bracts shorter than ped.	1. S. VIOLACEA.
Bracts as long as or longer than ped.	
Stem, leaves, and cal. hairy	2. S. ROBUSTA.
Stem, leaves, and cal. glabrous . . .	3. S. OBLONGA.

1. **S. violacea,** *Heyne in Wall. Cat.* n. 2136 (1828).

S. indica, Moon Cat. 44 (non L.). *S. floribunda*, Benth. in DC. Prod. xii. 418. Thw. Enum. 239. C. P. 217, 2716, 302.

Fl. B. Ind. iv. 668. Wight, Ic. t. 1449.

Stems numerous, erect prostrate or ascending, bluntly quadrangular, glabrous or pubescent; l. variable in size, ½–3 in., ovate or ovate-lanceolate, subcordate at base, usually acute, coarsely crenate- or dentate-serrate, glabrous above, finely pubescent beneath, petiole often as long as l., puberulous; fl. rather large, on short, spreading, glandular-pubescent ped., bracts oblong, obtuse, shorter than ped.; cor.-tube ½ in., pubescent outside; achene subglobose.

Var. β, **glabra,** *Trim. Syst. Cat. Ceyl. Pl.* 70. *S. oblonga*, var. *major*, Benth. l. c. 418. *S. violacea*, var. β, Thw. Enum. 240. C. P. 3370.

Glabrous; l. 2½–4 in., oval-lanceolate, acuminate, very acute, very coarsely dentate-serrate.

Moist region in shady places up to 7000 ft. Var. β, Ambagamuwa (Thwaites). Fl. all the year; very rich bright purple.

Also in S. India.

Very variable; at the high elevations it often becomes a small prostrate plant with rotundate leaves (C. P. 302, var. γ, Thw.). The flowers vary much in size. I have never seen them white or rose as described by Wight. Leaves often purple beneath.

2. **S. robusta,** *Benth. in DC. Prod.* xii. 418 (1848).
S. spicata, Trim. in Journ. Bot. xxiii. 241, and Syst. Cat. Ceyl. Pl. 70.

Stems strongly pubescent; l. 1½–2½ in., ovate-oblong, cordate at base, obtuse, crenate, very pubescent; fl. on very short ped., close, almost spicate, bracts broadly oval, longer than ped., densely hairy; cal. large, hairy, cor.-tube broad, very wide at mouth.

Upper montane zone; very rare. By streams on Adam's Peak at about 5500 ft. Fl. March; dark bright purple.

Also in the Nilgiris (*S. Wightiana*, Benth.).

Considered a variety of *S. violacea* in Fl. B. Ind.

3. **S. oblonga,** *Benth. in Bot. Reg. sub* t. 1493 (1832).
Benth. in DC. Prod. xii. 418 (excl. var γ). C. P. 2057.
Fl. B. Ind. iv. 668.

Semi-woody at base, stems 6–24 in., prostrate at base, ascending, much branched, quadrangular, glabrous, l. small, ¾–1½ in., narrowly oblong-lanceolate, tapering at base, sub-acute, with few coarse serrations, quite glabrous, petiole very short; fl. numerous, on short ped., erect, bracts as long as ped.; cal. glabrous; cor.-tube ⅜ in., glabrous, upper lip 3-lobed, lower quadrate-rotundate, faintly 3-lobed.

Montane zone, by streams in forests; common up to 7000 ft. Fl. all the year; bright violet-blue.

Endemic.

A very pretty plant, well adapted for garden cultivation.

13. **ANISOMELES,** *Br.*

Large perennial herbs, fl. numerous, rather large, whorls in spicate infl.; cal. narrowly ovoid, segm. 5, equal, very acute; cor.-tube short, upper lip small, erect, lower lip large, spreading, broad, 4-lobed; stam. 4, didynamous, exserted, fil. hairy, anth. of long stam. 1-celled, of short stam. 2-celled; style bifid, achenes glabrous.—Sp. 8; 4 in *Fl. B. Ind.*

L. ovate, softly pubescent . . . 1. A. OVATA.
L. oblong, white-tomentose . . . 2. A. MALABARICA.

1. **A. ovata,** *Br. in Ait. Hort. Kew, ed.* 2, iii. 364 (1811). **Yakwanassa,** *S.*

Herm. Mus. 30. Burm. Thes. 153. Fl. Zeyl. n. 24. *Ballota disticha,* L. Mant. 83. Moon Cat. 44. Thw. Enum. 240. C. P. 2072.

Fl. B. Ind. iv. 672. Burm. Thes. t. 71, f. 1. Wight, Ic. t. 865.

Stems 2–4 ft., stout, acutely quadrangular, woolly-pubescent; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., ovate, acute, deeply crenate-serrate, softly pubescent on both sides, petiole about 1 in., hairy; fl. nearly sessile, whorls dense, distant below but approximated above to form a dense spicate infl., bracts linear; cal.-tube long-campanulate, glandular and hairy, somewhat enlarged in fruit, segm. lanceolate, very acute, half as long as tube; upper lip of cor. oblong-oval, obtuse, lower lip with the two middle lobes large round deflexed, the lat. ones small; fil. with a tuft of long hairs in front.

Moist low country up to 3000 ft.; common. Fl. July–Sept.; white, the lower lobes of lip pale pink-violet.

Also in India, Malaya, China, and Philippine Is.

The leaves have a warm, slightly camphoraceous scent, and the plant is much used in native medicine. The smoke of this and the next is believed to drive away demons.

2. **A. malabarica,** *Br. in Bot. Mag.* t. 2071 (1819). **Peymaruddi,** *T.*

A. intermedia, Benth. in DC. Prod. xii. 456. C. P. 3572.

Fl. B. Ind. iv. 673. Wight, Ic. t. 864.

Stems 4–6 ft., semi-shrubby, erect, slightly branched, bluntly quadrangular, densely clothed with soft white woolly hair; l. 3–4 in., oblong-lanceolate, acute or obtuse at base, acute at apex, crenate-serrate, velvety-tomentose and white on both sides, petiole $\frac{1}{2}$ in., stout, woolly; fl. in dense cymes, whorls large, rather close but distinct, in long terminal infl., bracts linear, woolly; cal.-tube woolly-hairy, segm. narrowly lanceolate-subulate; lower lip of cor. very large, broader than long.

Dry region; rather common. Jaffna; Mannar; Batticaloa. Fl. June–March; pale purple, the lower lip darker.

Also in Peninsular India, Penang, and Mauritius.

14. **LEUCAS,** *Br.*

Perennial or annual herbs, fl. sessile or nearly so, whorls usually distant, cal. campanulate-tubular, 8- or 10-ribbed, mouth straight or oblique, with 8 or 10 small acuminate teeth; cor.-tube short, upper lip arched, erect, villous outside, lower lip large, flat, 3-lobed with the lat. ones small; stam. 4, not exserted; anth.-cells divaricate, confluent; style subulate, entire; achenes ovoid-triquetrous.—Sp. 50; 38 in *Fl. B. Ind.*

Mouth of cal. straight.
- L. ovate or oval; cal.-teeth over $\frac{1}{6}$ length of tube.
  - Whorls dense.
    - L. under 1 in. . . . . 1. L. MOLLISSIMA.
    - L. over 1 in.
      - Cal. hispid or villous . . . . 2. L. MARRUBIOIDES.
      - Cal. softly pubescent . . . . 3. L. ANGULARIS.
  - Whorls very lax . . . . 4. L. BIFLORA.
- L. linear; cal.-teeth minute . . . . 5. L. LONGIFOLIA.

Mouth of cal. very oblique; l. linear-lanceolate . 6. L. ZEYLANICA.

1. **L. mollissima,** *Wall. Cat.* n. 2054 (1828).
Thw. Enum. 240. C. P. 2075.
Fl. B. Ind. iv. 682.

Stems straggling, much branched, quadrangular, with adpressed reflexed pubescence; l. small, $\frac{1}{2}$–1 in., oval or ovate-oval, acute, coarsely serrate, silky-hairy above, more densely so and white beneath, petioles very short; whorls small, rounded, dense; cal. broadly tubular, 8-ribbed, teeth 8, triangular-subulate, not more than $\frac{1}{6}$ length of tube, cor. not seen.

'North of the Island, Gardner' (Thw. Enum.), but Gardner's specimens (C. P. 2075) are localised 'Alagoda and Peradeniya,' and may have been cultivated or an introduction. I have not met with it.

Also in India and China.

Our specimens do not seem specifically distinct from *L. marrubioides.*

2. **L. marrubioides,** *Desf. in Mem. Mus.* xi. 6 (1826). **Sudu-tumba,** *S.*
Thw. Enum. 240 *L. indica*, Moon Cat. 44. Benth. in DC. Prod. xii. 528. C. P. 2071.
Fl. B. Ind. iv. 683.

Perennial, stem 2–3 ft., erect, scarcely branched, rather stiff, stout, bluntly quadrangular, densely covered with fine silky white deflexed hairs; l. 1–3 in., ovate-oval, acute or obtuse at base, coarsely dentate-serrate, velvety above, white with dense silky tomentum beneath, petiole $\frac{1}{2}$ in., silky-hairy; fl. numerous, whorls dense, rounded, bracts linear, villous; cal. tubular, 8-ribbed, villous-hairy, teeth 8, triangular-subulate, often unequal, about $\frac{1}{4}$ as long as tube but variable; cor.-tube straight, slightly exserted.

Both moist and dry regions; common, especially abundant on rocky banks in the Uva country up to 5000 ft. Fl. May–August; white.

Also in S. India.

3. **L. angularis,** *Benth. in Wall. Pl. As. Rar.* i. 62 (1830).
L. pubescens, Thw. Enum. 240 (? Benth.).
Fl. B. Ind. iv. 684.

'Stem procumbent, pubescent, branches acutely 4-angled,

ciliate on the angles; l. shortly stalked, ovate, crenate, rugose, strigose-hispid or villous on both sides; whorls few-flowered, bracts minute; cal. tubular-campanulate, villous, equal at the mouth, teeth setaceo-acuminate, straight or recurved.'

This species is founded on a plant from Macrae in Hb. Lindley. Thwaites suggests it may be a variety of *L. marrubioides*, from which it is described as differing in its lax-flowered whorls, hispid calyx, and leaves pubescent not woolly beneath.

Also in Nilgiri Mts.

The description is taken from Bentham, as I have seen no specimen from Ceylon.

[*L. stelligera*, Wall.—The locality 'Ceylon' for this in Fl. B. Ind. iv. 686 is a mistake for Bombay.]

4. **L. biflora,** *Br. Prodr.* 504 (1810). **Geta-tumba,** *S.* **Péyt-tumpai,** *T.*

Herm. Mus. 65. Burm. Thes. 140. *Phlomis biflora*, Vahl, Symb. iii. 77. Moon Cat. 44. *L. procumbens*, Thw. Enum. 240 (non Desf.). C. P. 2053, 2074.

Fl. B. Ind. iv. 683. Burm. Thes. t. 63, f. 1. Wight, Ic. t. 866.

Perennial (?), stems often prostrate, with very long branches, quadrangular, pubescent with deflexed hair; l. variable, $\frac{1}{2}$–$2\frac{1}{2}$ in., lanceolate-ovate or ovate, acute or obtuse, very coarsely crenate-serrate, pubescent on both sides, petiole slender, fl. on very short ped., 1–4 in axil, whorls lax, distant; cal. softly pubescent, teeth about $\frac{1}{3}$ length of tube, subulate, strongly ciliate; lower lip of cor. with raised reticulate venation; achenes large, ovoid, smooth.

In all parts of the Island to highest elevations; very common. Fl. February, September; white.

Also in Southern India.

5. **L. longifolia,** *Benth. Lab.* 744 (1836).

Fl. B. Ind. iv. 684 (not given for Ceylon).

Annual (?), stem bare below, branched, bluntly quadrangular, pubescent; l. numerous, crowded, sessile or nearly so, 1–$1\frac{1}{2}$ in., linear, tapering to base, obtuse, entire, finely silky-pubescent, more strongly so on veins beneath, fl. nearly sessile, whorls numerous, few-flowered, closely approximated to form a dense narrow leafy spike, a few at the base separated, bracts short, linear, acuminate; cal. slightly curved, campanulate, minutely pubescent, faintly ribbed, mouth straight, nearly truncate, teeth very small, distant, acute.

The specimens in Herb. Per. are labelled by Thwaites 'Morowak Korale, July, 1868,' and were referred by him to C. P. 2076 as a variety of *L. zeylanica*. They are in bud only, and are from plants which have been 'topped,' and therefore not quite normal in growth. I do not feel certain as to the name. Perhaps an undescribed species.

Also in Western India.

6. **L. zeylanica,** *Br. Prodr.* 504 (1810). **Geta-tumba,** *S.* **Muditumpai,** *T.*

Herm. Mus. 1. Burm. Thes. 138. Fl. Zeyl. n. 227. *Phlomis zeylanica*, L. Sp. Pl. 586. Moon Cat. 44. Thw. Enum. 240. C. P. 2076.
Fl. B. Ind. iv. 689. Wight, Ill. t. 176.

Annual, stem 1–2 ft., erect, with long spreading branches from the base overtopping main stem, quadrangular, hispid-hairy; l. variable in size, 1–3½ in., nearly sessile, linear or lanceolate-linear, tapering to base, obtuse, shallowly serrate, often slightly recurved at margin, hispid on both sides, venation prominent beneath, impressed above, lat. veins very oblique; fl. nearly sessile, numerous, crowded, whorls only 2 or 3 usually combined to form a terminal head but the lowest often separate, bracts numerous, linear, bristle-pointed and strongly ciliate; cal. ¼ in., tubular-funnel-shaped, curved, finely pubescent, mouth oblique, teeth usually 8, very short, distant, upper one rather largest; lower lip of cor. with the middle lobe large truncate, the lat. ones very small, reflexed; achene brown, shining.

Var. β, **Walkeri,** *Hk. f.* *L. Walkeri*, Benth. l. c. 531.

Stems with reflexed hair; l. narrower; cal.-teeth usually 10; achenes pubescent.

Waste ground throughout the Island; very common. Var. β, on the montane patanas. Fl. September–February; pure white.
Also in Assam, Burma, China, Malaya.
A very variable plant. Both this and *L. marrubioides* are much used in native medicine.

15. LEONOTIS, *Br.*

Large annual herb; fl. large, nearly sessile, whorls few, large, dense, distant, bracts setaceous, spinous; cal. tubular, segm. 8 or 10, unequal, rigid, spinous, the uppermost much the largest; cor.-tube long, slightly curved, exserted, upper lip large, hooded, densely woolly on back, lower lip very small, 3-lobed, the middle lobe the longest; stam. included, anth.-cells divaricate; achene glabrous.—Sp. 12; 1 in *Fl. B. Ind.* (not African).

L. nepetæfolia, *Br. Prodr.* 504 (1810). **Maha-yak-wanassa,** *S.* **Kasitumpai,** *T.*

Moon Cat. 44. Thw. Enum. 241. C. P. 2070.
Fl. B. Ind. iv. 691. Wight, Ic. t. 867. Bot. Reg. 281.

Stem 4–6 ft., stout, erect, quadrangular with thickened angles, very finely pubescent; l. 2½–4 in., ovate, tapering into petiole, acute, coarsely dentate-serrate, very finely pubescent

on both sides, petiole 1½–2 in.; whorls subglobose, very dense, bracts numerous, deflexed; cal. ½ in., puberulous, bristly in upper part, segm. rigid, sharply spinous, cor. over ¾ in., erect.

Waste places in the dry and intermediate regions; common. Moon's locality is Kataragama. Fl. December–March; orange-scarlet.

Found throughout the Tropics, native country doubtful.

This looks quite wild here, and is a stately, handsome plant well worth cultivation; it is employed in native medicine.

16. **TEUCRIUM**, *L.*

Perennial herb, fl. very numerous, pedicellate, opp., in axillary racemes or panicles; cal. tubular-campanulate, 10-veined, segm. 5, the uppermost one erect, rather the largest, the two lowest narrower and somewhat connate; cor.-tube short, upper lip absent, lower lip long, 3-lobed, the middle lobe very large, stam. much exserted, anth. small, cells confluent; style bifid; achenes ovoid, rugose, with a large lateral areola.—Sp. 100; 8 in *Fl. B. Ind.*

T. tomentosum, *Heyne in Wall. Cat.* 2025 (1828).
Benth. in DC. Prod. xii. 582. Thw. Enum. 241. C. P. 212.
Fl. B. Ind. iv. 700.

Stems 2–3 ft., erect, stout, very bluntly quadrangular, finely puberulous, much branched above; l. 2–3 in., deltoid-ovate, cuneate at base, subacute, deeply dentate-serrate, puberulous above, white with fine pubescence beneath, petiole ¾–1 in.; fl. spreading, secund, bracts lanceolate, longer than ped.; cal. densely glandular-hairy, segm. lanceolate, acute; lower lip of cor. pubescent, middle lobe tongue-like, subacute.

Montane zone, 3000–6000 ft.; rather common. Fl. September, October. Also in S. Indian mountains.

CI.—PLANTAGINEÆ.

PERENNIAL herb, l. radical, fl. small, regular, bisexual, spicate on axillary scapes; sep. 4, imbricate, persistent; cor. scarious, tube oblong-ovoid, lobes 4, short, imbricate; stam. 4, inserted in cor.-tube, much exserted; ov. superior, 2-celled, with several ovules in each cell, style filiform; fruit a capsule, dehiscing by a circular line near the base; seeds several, attached by centre, embryo transverse in fleshy endosperm.

A small family, with no close allies.

PLANTAGO, *L.*

For characters, see Order.—Sp. 50; 10 in *Fl. B. Ind.*

P. major, *L. Sp. Pl.* 112 (1753), var. **asiatica,** *Dcne. in DC. Prod.* xiii. pt. 1, 696.

P. asiatica, L., Moon Cat. 11. Thw. Enum. 245. C. P. 2246.
Fl. B. Ind. iv. 705. Wight, Ill. t. 177 (*P. asiatica*).

Perennial herb with an erect stout rootstock; l. alt. radical, 1–3½ in., oval, tapering into and decurrent on petiole, obtuse or subacute, entire or more or less coarsely dentate or lobed, nearly glabrous or with scattered short hairs on both sides, 5-nerved, petiole usually much longer than l., wide, sheathing at base; fl. small, nearly sessile, in rather lax narrow spikes, 1–5 in. long, peduncles (scapes) erect, slender, usually much exceeding l., bracts shorter than cal.; sep. ovate, subacute with membranous margins, glabrous; cor.-lobes lanceolate, acute, reflexed; capsule ovate-ovoid, obtuse, apiculate, glabrous; seeds somewhat angled, dull, black.

Upper montane zone, by roadsides and in waste places; common. Occasionally imported to lower elevations.

Also in the mountains of India, Burma, and Malaya, and in China, &c. The type a very common European weed.

This appears to be a native, and I should be inclined to keep it separate specifically from the European *P. major*. But the Fl. B. Ind. does not even consider it as a variety. It varies much in size and length of spikes.

P. lanceolata, L. (C. P. 2247), is very common about N. Eliya, &c., but certainly introduced there with English grass-seed. It is included in Moon Cat. (1824).

CII.—NYCTAGINEÆ.

HERBS or shrubs, l. opp. or sub-opp., entire, without stip., fl. small, bisexual or diœcious, in cymes heads or umbels; perianth regular, tubular or funnel-shaped, corolloid, segm. 5, plaited in bud; stam. 2–10, exserted; ov. superior, 1-celled, with a single erect ovule; fruit membranous, enclosed in persistent per.-tube; seed erect, cotyledons large, folded round the soft endosperm.

Herbaceous; fl. bisexual; stam. 2–5 . . . . . 1. BOERHAAVIA.
Spiny climbing shrub; fl. diœcious; stam. 6–10 . . 2. PISONIA.

1. BOERHAAVIA, *L.*

Perennial herbs, l. opp., often unequal, fl. small, in paniculate heads or umbels, jointed on ped.; perianth gamophyllous, tube slender, limb funnel-shaped, 5-lobed; stam. 2–5, exserted, anth. small, didymous; ov. superior, stalked, 1-celled, stigma peltate; fruit small, enclosed in glandular per.-tube, seed solitary, cotyledons broad, folded round endosperm.—Sp. 30; 6 in *Fl. B. Ind.*

L. rounded; fl. nearly sessile . . . . 1. B. DIFFUSA.
L. very acute; fl. on long ped. . . . 2. B. REPANDA.

1. **B. diffusa,** *L. Sp. Pl.* 3 (1753). **Pita-sudu-pala,** S. **Múkkaraichchi, Karichcháranai,** *T.*

Burm. Thes. 56. Fl. Zeyl. n. 10. *B. glutinosa,* Moon Cat. 5. Thw. Enum. 245. C. P. 1099.
Fl. B. Ind. iv. 709 (*B. repens*). Wight, Ic. t. 874 (*B. procumbens*).

Root large, fusiform, stems prostrate or ascending, much divaricately branched, slender, cylindrical, much thickened at nodes, minutely pubescent, purplish; l. at each node unequal, the larger 1–1½ in., the smaller ½–¾ in., broadly oval or subrotundate, rounded or subcordate at base, rounded at apex, entire, somewhat undulate, glabrous and green above, silvery-white with a layer of very minute scales beneath, petiole slender, as long as l.; fl. very small, shortly stalked or nearly sessile, 4–10 in small umbels arranged in small, slender, long-stalked, corymbose, axillary, and terminal panicles, viscous with white sessile glands, bracts very small, lanceolate, acute; per.-tube contracted above ov., glandular-viscid, lobes bifid, each segm. obtuse; stam. 2, slightly exserted; fruit ⅛ in., membranous, closely invested with the persistent per.-tube, which is oblong-ovoid, broadly and bluntly 5-ribbed, very glandular.

Waste sandy ground in the low country; a very common weed, especially near the coast. Fl. all the year; bright purplish-pink.
Tropics of both worlds.

Leaves have a hot taste; the plant is much used in medicine as a stomachic carminative. Thunberg (Travels, iv. 205) says it bore the name of *Jan Lopes* root at Colombo. When axillary the infl. is from axils of the smaller l. only. The very viscid per.-tube containing the fruit readily adheres to other objects, and, being lightly articulated on ped., is readily removed and carried away. Small insects are caught by the secretion.

2. **B. repanda,** *Willd. Sp. Pl.* i. 22 (1797).
Trim. in Journ. Bot. xxiii. 172.
Fl. B. Ind. iv. 709 (not given for Ceylon). Wight, Ic. t. 1766.

Stems 3–4 ft. or more, semi-scandent, with very long inter-

nodes, cylindrical, glabrous; l. nearly equal, $1\frac{1}{2}$–$2\frac{1}{2}$ in., ovate, rounded or cordate at base, very acute, repand, glabrous above, slightly hairy beneath, petiole $\frac{1}{2}$–1 in.; fl. rather large, on long capillary ped., 3–8 in long-stalked umbels arranged in very lax, divaricate, glabrous, axillary panicles much exceeding the l.; perianth $\frac{1}{3}$ in., tube long, very slender beyond the ov., segm. spreading, 2-lobed; stam. 5, much exserted; fruit over $\frac{1}{4}$ in., linear, obtuse, faintly ribbed, ringed with distant lines of large sessile glands.

Seacoast in the dry region; rare. Kirinda, S. Prov., abundant; near Kankesanturai, Jaffna. Fl. December–February; bright pink.

Also in India, Beluchistan, and Burma.

Mirabilis Jalapa, L., *Sendrikka*, S., the 'Marvel of Peru' of the English, is a very common weed in the moist region. It is native to Peru, but must have been an early introduction to the Old World. Hermann has it (Mus. 67) under its native name. It occurs with yellow, bright purple, white, and striped flowers.

2. **PISONIA,** *L.*

Climbing shrub with curved axillary spines, l. sub-opp.; fl. small, unisexual, diœcious, in panicled cymes; male fl.: perianth funnel-shaped, lobes 5, large, deep, stam. 6–10, much exserted; fem. fl.: perianth tubular, lobes minute, stigma capitate, lacerate; fruit enclosed in glandular, persistent perianth, pericarp very thin; seed solitary, embryo with large cotyledons surrounding scanty endosperm.—Sp. 60; 3 in *Fl. B. Ind.*

P. aculeata, *L. Sp. Pl.* 1026 (1753).
Thw. Enum. 245. C. P. 2266.
Fl. B. Ind. iv. 711. Wight, Ic. t. 1763–4.

Large scandent shrub, branches very numerous, divaricate, with many strong curved very sharp axillary spines (abortive branchlets) in the axils; l. $1\frac{1}{2}$–3 in., oval, tapering to base, entire, obtuse, quite glabrous, petiole $\frac{1}{2}$ in.; fl. on short pubescent ped. in small rounded cymose clusters combined into small pedunculate axillary panicles, bracts very small, hairy; perianth pubescent outside, lobes acute, spreading; fruit-perianth about $\frac{1}{3}$ in., oblong-ovoid, very blunt, pubescent, faintly 5-angled, with 5 double vertical lines of stalked very viscous glands.

Dry region; rare. Mullaitivu (Gardner); Hambantota; Uma-oya; near Kankesanturai, Jaffna. Fl. February–April, September; greenish-white.

In the Tropics of both hemispheres.

P. morindæfolia, Br. (*P. alba*, Span.), is the 'Lettuce Tree' much cultivated on the coast for its bright greenish-yellow foliage, and called *Lechchai Kedda* or *Chandi* by the Tamils in the north. The male tree has the leaves much darker green, and is therefore not much grown. Kurz. (For. Fl. Burm. ii. 279) gives this as native on the seashore of the Andaman Is. It is also found in Nicobar Is. apparently, and extends throughout the Malay and Pacific Archipelagos as a littoral plant. It very rarely flowers here. The young whitish leaves are eaten by the Sinhalese, and called 'Wata-banga-kola.'

CIII.—AMARANTACEÆ.

HERBS or undershrubs, l. opp. or alt., without stip., fl. small, bisexual (rarely unisexual), sessile or nearly so, in clusters or spikes, with a scarious bract and 2 small bractlets at base; perianth-leaves 5, distinct, more or less scarious, persistent, sometimes spinescent, imbricate; stam. 1–5, opp. per.-leaves, fil. free or connate at base or with 5 alt. staminodes; ov. superior, 1-celled, with 1 or several erect basal ovules on capillary funicles; fruit with a membranous pericarp (utricle), enclosed in persistent per.-leaves, usually indehiscent; seed solitary, erect, with the annular or horseshoe-shaped embryo curved round mealy endosperm.

L. alternate (see also under 9).
  Seeds several . . . . 1. CELOSIA.
  Seeds solitary.
    Fl. bisexual.
      Fruit with circumscissile dehiscence . . 2. ALLMANIA.
      Fruit indehiscent . . . . . . 3. DIGERA.
    Fl. unisexual . . . . 4. AMARANTUS.
L. opposite.
  Anth. 2-celled.
    Perfect fl. surrounded by deformed ones.
      Staminodes 5 . . . . 5. CYATHULA.
      Staminodes 0 . . . . 6. PUPALIA.
    All. fl. perfect.
      Staminodes 0.
        Stam. 5 . . . . 7. PSILOTRICHUM.
        Stam. 2 . . . . 8. NOTHOSÆRUA.
      Staminodes 5.
        Bractlets not spinous, sep. herbaceous . 9. AERUA.
        Bractlets spinous, sep. hard and stiff . 10. ACHYRANTHES.
  Anth. 1-celled . . . . 11. ALTERNANTHERA.

All the 25 species are found in the dry region, of which this Family is rather characteristic, and 14 of them are confined to it. The rest extend

also into the moist region, and are mostly weeds of cultivated ground; scarcely any ascend into the montane zone. *Achyranthes diandra* is the only endemic species.

1. CELOSIA, *L.*

Herbaceous, l. alt., fl. sessile, in clusters or spikes; perianth-leaves 5, scarious; stam. 5, fil. connate below, forming a short hypogynous cup, anth. 2-celled, staminodes 0; ov. with several erect ovules; fruit a membranous capsule with circumscissile dehiscence; seeds several, reniform, compressed.—Sp. 30; 4 in *Fl. B. Ind.*

Fl. in dense spikes 1–5 in. long . .	1. C. ARGENTEA.
Fl. in small clusters on spicate infl.	
L. over 1 in., tapering at base . .	2. C. PULCHELLA.
L. under 1 in., subcordate at base .	3. C. POLYGONOIDES.

1. **C. argentea,** *L. Sp. Pl.* 205 (1753). **Kiri-henda,** *S.*
Moon Cat. 18. Thw. Enum. 247. *C. albida,* Willd., Moon Cat. 18. C. P. 2245.
Fl. B. Ind. iv. 714. Wight, Ic. t. 1767.

Annual, stem 1–3 ft., erect, with ascending branches, striate, glabrous, l. sessile, 1–3 in., linear or linear-lanceolate, acute at both ends, entire, glabrous; fl. numerous, densely crowded and imbricate in a close cylindrical terminal spike 1–5 in. long, bracts linear-lanceolate, scarious, acute; perianth-leaves $\frac{1}{3}$ in., twice as long as bracts, lanceolate, acute, erect, semi-transparent; fil. short; ov. globose, style long, straight, filiform; fruit dehiscent about the middle; seeds 4–8, black, polished.

Low country; very common in cultivated ground in the dry region, and rarer in the moist districts. Fl. all the year; silvery-white, at first purplish-pink.

Throughout the Tropics, either cultivated or as a weed.

A very conspicuous plant in the sandy fields of the dry districts.

2. **C. pulchella,** *Moq. in DC. Prod.* xiii. 2, 238 (1849).
Thw. Enum. 247. C. P. 2238.
Fl. B. Ind. iv. 715. Wight, Ic. t. 1768.

Annual (?), often semi-woody at base, stem 1–3 ft., erect, with many spreading or ascending branches, glabrous; l. $1\frac{1}{4}$–$2\frac{1}{4}$ in., ovate, rounded below but tapering at very base, acute, apiculate, entire, glabrous, thin, petiole about $\frac{1}{2}$ in.; fl. small, 2 or 3 together in little clusters distantly placed on elongated, slender, unbranched, terminal spikes, bracts very small, acute; per.-leaves oval, acute, scarious; fruit exceeding per. topped with a thickened head; seeds about 12, minutely dotted, black.

Dry region; rather common, extending into intermediate districts. Anuradhapura, abundant; Lagalla; Maturata. Fl. September–December; white.

Also in S. India.

3. **C. polygonoides,** *Retz. Obs. Bot.* ii. 12 (1781).
Thw. Enum. 247. C. P. 2240.
Fl. B. Ind. iv. 715.

Perennial, stems from a woody rootstock, 1–2 ft., roughly pubescent; l. small, $\frac{3}{4}$–1 in., broadly ovate, subcordate at base, obtuse or acute, entire, glabrous above, pubescent on veins beneath, petiole $\frac{1}{2}$ in., pubescent; fl. 2 or 3 in small distant clusters on erect, slender, terminal spikes, bracts small, inconspicuous; per.-leaves lanceolate-oblong, acute, capsule oblong-ovoid, topped with a large head; seeds about 10, black.

Dry region; very rare (or overlooked). Mannar (Gardner).

Also in S. India.

2. ALLMANIA, *Br.*

Annual, l. alt., fl. bisexual, sessile, crowded in dense, axillary (or apparently terminal), capitulate cymes, bracts scarious, shorter than perianth, per.-leaves 5, narrow; stam. 5, fil. united into a shallow cup at base, staminodes 0; stigma shortly bifid, ovule erect; fruit membranous, with circumscissile dehiscence, seed surrounded by a cupular aril, smooth.—Sp. 2 or 3; 2 in *Fl. B. Ind.*

A. nodiflora, *Br. in Wall. Cat.* n. 6890 (1828). **Kumatiya,** *S.*
Herm. Mus. 1. Burm. Thes. 16, 17. Fl. Zeyl. n. 101. *Celosia nodiflora*, L. Sp. Pl. 205. Moon Cat. 19. *Chamissoa nodiflora*, Mant., Thw. Enum. 247. C. P. 2726.
Fl. B. Ind. iv. 716. Burm. Thes. t. 5, f. 2. Wight, Ic. t. 1770, 1771 (*A. dichotoma*), 1772 (*A. aspera*).

Stems 1–3 ft., spreading, prostrate or ascending, much branched, more or less pubescent; l. numerous, 1–2$\frac{1}{2}$ in., very variable, linear-oblong or broadly oval, tapering to base, obtuse or acute, apiculate, glabrous or pubescent, nearly sessile or petiole obscure; heads sessile or stalked, few- or many-flowered, more or less globose, dense or lax, sometimes drooping, bracts pubescent, per.-leaves acuminate, very acute, shining, silvery; seed globose-compressed, dull black.

Var. β, **longepedunculata,** *Trim.*, Wight, Ic. t. 1769 (*Chamissoa albida*).

Heads larger, often ovoid, on long peduncles.

Low country (and up to 5000 ft. rarely), principally in the dry region;

rather common. Var. β much the commoner. Fl. November–March; white.

Also in India, China, and Malaya.

The Fl. B. Ind. keeps up *A. albida*, Br. as a separate species, but the characters are merely comparative. (The name *albida* should be dropped for this, as *Celosia albida*, Willd., was based on *C. pyramidalis*, Burm., whose figure (Fl. Ind. t. 25, f. 1) represents a form of *C. argentea*).

3. **DIGERA,** *Forsk.*

Annual, l. alt., fl. sessile, in threes (the 2 lateral reduced to laciniate scales), arranged in lax axillary spikes; per.-leaves 5 (or 4), the 2 outer longer; stam. 5, fil. distinct, staminodes 0; stigmas 2, ovule erect; fruit hard, indehiscent, 1-seeded.—Monotypic.

D. arvensis, *Forsk. Fl. Ægypt-Arab.* 65 (1775). **Toggil,** *T.*

Achyranthes muricata, L., Moon Cat. 18. Thw. Enum. 249. C. P. 3912.

Fl. B. Ind. iv. 718. Wight, Ic. t. 732 (*Desmochæte muricata*).

Stems 1–2 ft., with glabrous spreading branches, l. 1¼–2 in., ovate, rounded at base, acute, entire, glabrous, petiole ½–1 in.; fl. laxly arranged in long-stalked spikes, bracts lanceolate, acute, membranous, persistent, abortive fl. bract-like, closely pressed against central one, bifid and laciniate; per.-leaves oblong-oval, acute; fruit globose, muriculate, included in perianth.

Dry and desert regions; rare. Jaffna (Moon); Tissamaharama, near Hambantota, abundant; Mannar. Fl. December–February; rose-coloured.

Dry parts of India and Burma; Beluchistan, Arabia, N. Africa, and Java.

4. **AMARANTUS,*** *L.*

Annuals, l. alt., fl. small, unisexual, monœcious, in small clusters; per.-leaves 3 or 5, often aristate; stam. 3 (rarely 2) or 5, distinct, free, staminodes 0; ovule erect, stigmas 2 or 3 spreading; fruit very thin, circumscissile or indehiscent; seed orbicular, slightly compressed, black and polished.—Sp. variously estimated; 10 in *Fl. B. Ind.*

Sep. and stam. 5 . . . . . . 1. A. SPINOSUS.
Sep. and stam. 3 (or 2).
  Some clusters of fl. in terminal spikes.
    Bracts longer than sep. . . . 2. A. GANGETICUS.
    Bracts shorter than sep. . . . 4. A. VIRIDIS.
  All clusters of fl. axillary.
    Fruit smooth, dehiscent . . . 3. A. MANGOSTANUS.
    Fruit rugose, indehiscent. . . 5. A. POLYGONOIDES.

---

* Ἀμάραντος, unfading, from the persistent texture of the flowers.

1. **A. spinosus,** *L. Sp. Pl.* 991 (1753). **Katu-tampala,** *S.* **Mudkirai,** *T.*

Herm. Mus. 62; Hort. Acad. Lugd.-Bat. 31. Burm. Thes. 18. Fl. Zeyl. n. 338. Moon Cat. 63. Thw. Enum. 247. C. P. 2910.

Fl. B. Ind. iv. 718. Herm. Hort. Acad. Lugd.-Bat. t. 33. Wight, Ic. t. 513.

Stem 12–18 in., stout, glabrous and polished, much branched, cylindrical, with a pair of very sharp divaricate opposite spines in l. axils at the base of the bud or branch, l. $1\frac{1}{4}$–$2\frac{1}{4}$ in., ovate-lanceolate, tapering to base, obtuse, spinous-apiculate; entire, undulate, glabrous above, slightly scurfy beneath, lat. veins numerous, prominent beneath, petiole $\frac{1}{2}$–2 in., fl. very numerous, sessile, clusters dense both axillary and in terminal interrupted spikes, male fewer than female, bracts linear, bristle-pointed; per.-leaves 5, rather longer than bracts, ovate, bristle-pointed, stam. 5, spreading; ov. pointed, pubescent, styles 2, long, spreading, hairy.

Waste ground throughout the Island; very common. Fl. September–December; pale green.

Tropics generally.

A. caudatus, L. (*A. cruentus*, L.) is common in gardens, and is sometimes found as an escape. It is recorded by Hermann (Mus. 64), but does not seem to have a native name. In English gardens it is well known as 'Love-lies-bleeding.' *A. hypochondriacus*, L., the 'Prince of Wales's Feather' of gardens, occurs under similar conditions.

A. frumentaceus, Ham. in Roxb. (? *A. paniculatus*, L.), 'Ranatampala,' S., is cultivated for its seeds, forming a grain known as 'Landesi.' It is figured in Wight, Ic. t. 720.

2. ***A. gangeticus,** *L. Syst. Nat.* ed. 10, 1268 (1759). **Sudu-tampala,** *S.* **Chirukirai, Arikirai,** *T.*

A. oleraceus, Roxb., Moon Cat. 63. Thw. Enum. 247 (non L.). C. P. 3629.

Fl. B. Ind. iv. 719. Wight, Ic. t. 715 (*A. oleraceus*).

Stem 2–3 ft., erect, stout, often tinged with purple, glabrous or slightly pubescent; l. large, 3–6 in., rhomboid-oval or lanceolate, much tapering at base and decurrent on long petiole, obtuse, bristle-pointed, often finely erose on margin, glabrous, thin, veins very prominent beneath, fl. in large axillary clusters and in long branched interrupted drooping terminal spikes, bracts numerous, filiform, bristle-pointed, spreading, squarrose; per.-leaves 3, rather shorter than bracts, lanceolate, with a long filiform apex; stam. 3; styles 3; seeds with a narrow raised border.

Low country; a common weed, but always as an escape from cultivation. Fl. October–December; pale green.

Found throughout the Tropics.

Much grown in native gardens as a vegetable or pot-herb. The

handsome garden annuals, cultivated for their bright-coloured leaves, *A. tricolor*, L., and *A. melancholicus*, L., are varieties of this species, which even in the semi-wild state often has the leaves blotched with purple.

3. **A. mangostanus,** *L. Amœn. Acad.* iv. 294 (1759).
A. polygamus, Thw. Enum. 247 (non L.). C. P. 3642.
Fl. B. Ind. iv. 720. Wight, Ic. t. 514 (*A. tristis*).

Stem usually procumbent, much branched, nearly glabrous; l. small, ½–1 in., oval or rhomboid-oval, tapering to base, obtuse, entire, glabrous, lat.-veins prominent beneath, petiole nearly as long as l.; fl.-clusters dense, all axillary, bracts numerous, squarrose, lanceolate, awned; per.-leaves 3, lanceolate, awned; stam. 3; styles 3; seed ovoid.

Waste and cultivated ground; a common weed, especially in the dry region. Fl. October–January; green.

Throughout India.

Scarcely more than a stunted prostrate form of *A. gangeticus.*

4. **A. viridis,** *L. Sp. Pl.* ed. 2, ii. 1405 (1762). **Kura-tampala,** *S.*
Euxolus caudatus, Moq., Thw. Enum. 248. *A. gracilis*, Desf., Trim. Syst. Cat. 72. C. P. 2911.
Fl. B. Ind. iv. 720. Wight, Ic. t. 1773 (*Euxolus caudatus*).

Stem 12–18 in., erect, much branched, cylindrical, glabrous and shining, usually purplish; l. 1½–2½ in., ovate or deltoid-ovate, truncate or acute at base, deeply notched at apex, very finely and faintly serrate, glabrous, petiole nearly as long as l., fl. very small, sessile, clusters axillary and in slender, tapering, interrupted, terminal and axillary paniculate spikes, bracts ovate, acute, glabrous; per.-leaves 3, longer than bracts, broadly oval, subacute, membranous with a green keel; stam. 3 (or 2); styles 2 or 3, short; fruit compressed, pointed, rugose, glabrous, indehiscent, seed lenticular.

Roadsides and waste ground; very common and gregarious. Fl. October–December, &c.; pale green.

In all Tropical and warm countries.

One of the most abundant of roadside weeds. I do not think it is ever cultivated, though eaten as a pot-herb like the other species. Sir J. Hooker vouches for this being *A. viridis* of Linnæus's herb.

5. **A. polygonoides,** *L. Am. Acad.* v. 409 (1760). **Araikkirai,** *T.*
Moon Cat. 63. *Euxolus polygonoides*, Thw. Enum. 248. C. P. 3643.
Fl. B. Ind. iv. 721 (*A. polygamus*, L.). Wight, Ic. tt. 512, 719.

Stem prostrate with many spreading branches, glabrous; l. small, ¼–½ in., obovate-lanceolate or spathulate, acute at base, obtuse or rounded, sharply apiculate, rather stiff, glabrous; fl.-clusters all axillary, bracts subulate, sharply acuminate; per.-leaves 3, oblong, sharply acuminate; stam.

3; styles 3; fruit urceolate, tapering to sharp point, deeply wrinkled, indehiscent.

Dry waste places and roadsides in the dry region; common. Fl. all the year.

In all Tropical countries.

Linnæus gives Ceylon as a locality for his *A. polygonoides;* but, if this be also his *A. polygamus,* that name has priority.

A. Blitum, L. (scarcely distinct from *A. polygonoides*), is given for Ceylon in Fl. B. Ind. The cultivated form of this is true *A. oleraceus,* L. I have not seen it here.

5. **CYATHULA,** *Lour.*

Annual, l. opp., entire, fl. in solitary or capitulate clusters, one perfect the rest reduced to hooked or glochidiate awns; per.-leaves 5, awned or not; stam. 5, fil. connate below to form a cup with 5 truncate staminodes alternating with stam.; ovule pendulous from a basal funicle; fruit indehiscent, very thin; seed oblong.—Sp. 10; 4 in *Fl. B. Ind.*

Fl.-clusters in globose heads . . .	1. C. ZEYLANICA.
Fl.-clusters solitary	2. C. PROSTRATA.

1. **C. zeylanica,** *Hk. f. in Fl. B. Ind.* iv. 723 (1885).
C. capitata, Thw. Enum. 249 (non Moq.).
Fl. B. Ind. iv. 723.

Stem long, 2–4 ft., slightly branched, pubescent or hairy especially when young, somewhat thickened at nodes; l. $1\frac{1}{4}$–$2\frac{1}{4}$ in., oval, acute at both ends, apiculate, entire, silky-hairy on both sides especially beneath; fl.-clusters capitulate, heads sessile, globose in an oblong-ovoid terminal infl., bracts short, ovate, acuminate, persistent, imperfect fl. 2 in each cluster; per.-leaves ovate, membranous, hairy, tapering into a long stiff awn with reflexed prickles (glochiate) at the top; staminodes broadly oblong, much fimbriated; fruit not seen.

Dry country; very rare. Uma-oya, on Lower Badulla Road (Thwaites). Fl. March.

Endemic.

I have seen only the C. P. specimens collected in 1854, which are somewhat imperfect.

2. **C. prostrata,** *Bl. Bijd.* 549 (1826). **Bin-karal-heba,** *S.*
Achyranthes prostrata, L., Moon Cat. 18. Thw. Enum. 249. C. P. 2242.
Fl. B. Ind. iv. 723. Wight, Ic. t. 733 (*Desmochæte prostrata*).

Stem 1–3 ft., prostrate below and rooting at the lower nodes, branched from the base, slender, thickened at nodes,

hairy, purplish; l. $1\frac{3}{4}$–3 in., rhomboid-oval, acute at both ends, entire, slightly hairy on both sides, thin, rather bullate, paler and often pinkish beneath, petiole very short; fl.-clusters small, solitary, shortly stalked, drooping, very laxly arranged in long, very slender, stalked terminal spicate infl., imperfect fl. several, pubescent, with the per.-leaves terminating in short recurved and hooked awns; per.-leaves of perfect fl. lanceolate, acute, not awned, pubescent with white hair; staminodes 3- or 4-fid.; seed pale brown, highly polished.

Low country, in grassy places; a very common weed. Fl. October–December; greenish, awns pink.

Throughout the Tropics.

Slightly purgative and digestive, used for dysentery in native medicine.

Loureiro's name, *C. geniculata* (1790), ought to be adopted by the rules of priority. A small erect slender variety (var. *debilis*, Moq.) is given for Ceylon in DC. Prod. xiii. 2, 326.

6. **PUPALIA,** *Juss.*

Perennial, sometimes semi-shrubby at base, l. opp., entire, fl. sessile, in clusters, 1 or 2 perfect, the rest reduced to stiff subulate awns elongating and spreading with fruit, often branched and ending in a very sharp hooked point; per.-leaves 5, acuminate, woolly outside; stam. 5, distinct, staminodes 0; ovule pendulous from a basal funicle; fruit indehiscent.—Sp. 3; all in *Fl. B. Ind.*

L. over 2 in., ovate, acuminate . . . . 1. P. ATROPURPUREA.
L. under 1 in., rotundate, very obtuse . . . 2. P. ORBICULATA.

1. **P. atropurpurea,** *Moq. in DC. Prod.* xiii. 2, 331 (1849). **Wel-karal-héba,** *S.*

Herm. Mus. 1. Burm. Thes. 47. Fl. Zeyl. n. 103. *Achyranthes lappacea*, L., Sp. Pl. 204; Moon Cat. 18. Thw. Enum. 249. C. P. 2237.

Fl. B. Ind. iv. 723. Burm. Thes. t. 18, f. 1. Wight, Ic. t. 731 (*Desmochæte atropurpurea*).

Stem 2–5 ft., straggling or semi-scandent, cylindrical, swollen at nodes, glabrous or slightly rough, often tinged with purple; l. 2–4 in., ovate or ovate-lanceolate, suddenly contracted at base, acuminate, sharply apiculate, glabrous, petiole short; fl.-clusters sessile, in rather lax, stalked, terminal, spicate infl., bracts small, acuminate, persistent, imperfect fl. reduced to mere awns, glabrous; per.-leaves ovate-lanceolate, acute, with long cottony wool outside.

Dry region, rather common. Dambulla; Kurunegala; Uma-oya; Mineri; Jaffna. Fl. Jan.–March, August; green, awns purplish-pink.

Also in India, Malaya, Philippines, Madagascar, S. Africa.

2. **P. orbiculata,** *Wight, Ic.* v. 2, 4 (1852). **Kumiḍḍil, Pichu-kodiya,** *T.*
Thw. Enum. 249. C. P. 2234.
Fl. B. Ind. iv. 724. Wight, Ic. t. 1783.

Stem woody at base, often prostrate, stout, with long opp. branches, pubescent; l. ¾–1 in., broadly oval or rotundate, suddenly tapering into petiole, very obtuse, apiculate, hairy on both sides, rather thick, petiole short or obscure; fl.-clusters as in *P. atropurpurea* but rather larger; hooked awns (imperfect fl.) much lengthening and spreading in fruit; fil. dilated at base; seed black and polished.

Sandy seashores in the dry region, common. Fl. Dec.–Feb.; white, awns yellow.
Also in S. India.
The heads when in fruit form large globose burs, which become detached, and are carried about by means of the strongly hooked awns.

7. PSILOTRICHUM, *Bl.*

Perennial herbs or shrubs, l. opp., fl. sessile, each with 2 bractlets at base, in short dense spikes; perianth-l. 5, slightly unequal; stam. 5, fil. connate at base to form a shallow cup, no staminodes; stigma capitate, ovule solitary, pendulous from long basal funicle; fruit membranous, indehiscent; seed solitary, ovoid, compressed.—Sp. 10; 5 in *Fl. B. Ind.*

Shrubby; sep. rigid, chartaceous . . 1. P. SCLERANTHUM.
Herb; sep. soft, herbaceous . . 2. P. CALCEOLATUM.

1. **P. scleranthum,** *Thw. Enum.* 248 (1861).
C. P. 2239.
Fl. B. Ind. iv. 725.

A small shrub with slender divaricate branches, bark grey, smooth, young branches very slender, hairy; l. 1–1½ in., oval-lanceolate, tapering into obscure petiole, acute, entire, finely pubescent on both sides; fl. crowded, spikes terminal, often in threes, sometimes branched, bracts ovate, acuminate, pubescent, persistent, bractlets rotundate-ovate, adpressed to fl. mucronate, glabrous; per.-leaves lanceolate, very acute, rigid, chartaceous, pubescent outside; seed oblong, brownish-red, polished.

Dry country, rare. Anuradhapura (Gardner); Uma-oya; Haragama; about Tissamaharama, abundant. Fl. Dec.; whitish.
Endemic.

2. **P. calceolatum,** *Moq. in DC. Prod.* xiii. 2, 280 (1849).
Ptilotus ovatus, Moq., Thw. Enum. 248. C. P. 2235.
Fl.. B. Ind. iv. 725. Wight, Ic. t. 1775 (*P. nudum*).

Perennial herb, stems numerous, 1–2 ft., cylindrical, hairy, l. numerous, nearly sessile, $1\frac{1}{4}$–$1\frac{3}{4}$ in., ovate-oblong or -lanceolate, acute at base, subacute, apiculate, often obscurely crenate, very sparingly hairy and ciliate; spikes axillary, sessile or peduncled, bracts ovate, acute, reflexed, persistent, bractlets very broad, short, per.-leaves ovate, acute, green with a broad white scarious margin, hairy on back; seed broadly ovoid, chestnut-brown.

Dry country, rare. Mineri; Anuradhapura; Mantai; Jaffna. Fl. Jan.–March; pale green.

Also in S. India.

The Fl. B. Ind. gives Moon as collector of this in Ceylon.

8. **NOTHOSÆRUA,** *Wight.*

Annual, erect, l. opp., fl. minute, in very numerous, dense, axillary spikes; per.-leaves 4 or 5, hyaline, woolly outside; stam. 2 (or 1), no staminodes; stigma capitellate, ovule solitary, pendulous from basal funicle; utricle indehiscent; seed lenticular.—Monotypic.

N. brachiata, *Wight, Ic.* vi. 1 (1853). **Tampala,** *S.* **Chiṛupílai,** *T.*

Thw. Enum. 248. C. P. 2254.

Fl. B. Ind. iv. 726. Wight, Ic. t. 1776 (excl. analyses) (*Ærua floribunda*), and t. 1776 bis f. B (analyses) (*Pseudanthus brachiatus*).

Stem $\frac{1}{2}$–2 ft., erect, with many spreading branches, glabrous or nearly so, l. small, $\frac{3}{4}$–$1\frac{1}{2}$ in. on main stem, much smaller on branches, lanceolate-oblong, tapering to base, acute, apiculate, glabrous or minutely puberulous, very thin; fl. sessile, densely crowded, spikes $\frac{1}{6}$–$\frac{1}{3}$ in., sessile, solitary or clustered, bracts and bractlets acute, glabrous, white and scarious; per.-l. lanceolate, acute or obtuse; seeds minute, black, highly polished.

Cultivated and waste sandy ground, seashore, &c., in the dry region, very common. Fl. Feb., Sept., &c.; white, shining.

Throughout India, Burma, Mauritius, Trop. Africa.

This is very like *Ærua lanata*, and Wight has increased the difficulty of distinguishing them by placing the analysis of the former to the figure of the latter. But, apart from the staminal characters, this has a more slender, erect habit, narrower and more membranous leaves, and much smaller flowers.

9. **ÆRUA,*** *Forsk.*

Herbs or undershrubs, l. alt. or opp., fl. small or minute, sometimes unisexual, in dense spikes, bracts and bractlets not spinous; per.-leaves 4 or 5, membranous or papery, more or less woolly outside; stam. 4 or 5, connate at base, with inter-

* Often printed *Aerva.* Derived from an Arabic name.

posed staminodes, forming a cup round ov.; style long or short, stigma capitellate or 2, ovule solitary, pendulous from basal funicle; fruit indehiscent.—Sp. 10; 6 in *Fl. B. Ind.*

L. oblong or oval; sep. 5	
Stellate-woolly; heads in terminal panicle	1. Æ. JAVANICA.
Cottony-hairy; heads axillary	2. Æ. LANATA.
L. narrowly linear; sep. 4	3. Æ. MONSONIÆ.

1. **Æ. javanica,** *Juss. in Ann. Mus.* xi. 131 (1827).

Herm. Mus. 8. Fl. Zeyl. n. 102. *Celosia lanata*, L. Sp. Pl. 205. *Illecebrum javanicum*, Ait., Moon Cat. 19. Thw. Enum. 248. C. P. 2255.

Fl. B. Ind. iv. 727. Wight, Ic. t. 876.

Semi-shrubby, stem 2–3 ft., branched, cylindrical, covered with a thick white coat of very dense stellate wool which is easily detached; l. nearly sessile, alt., 1–1½ in., linear-oblong or oblong-spathulate, rounded and slightly emarginate or acute, with dense woolly coat like the stem; fl. sessile, unisexual, usually diœcious, in linear or oblong spikes arranged in naked terminal panicles, bracts large, broadly ovate, acute, white, papery, veinless; per.-l. 5, rather unequal, lanceolate or oval, papery, densely covered outside with long woolly hair, stigmas 2, long; seed lenticular, black, polished.

Sandy seashores in the dry region, rare. Neduntivu I. (=Delft) (Gardner); Karativu, Kalpitiya. Fl. Sept.; white.

Also in dry parts of India and Burma, Arabia, Trop. Africa, &c.

Male fl. are said to be very few.

2. **Æ. lanata,** *Juss. in Ann. Mus.* xi. 131 (1827). **Pol-kudu-pala,** *S.*

Herm. Mus. 2. Burm. Thes. 60. Fl. Zeyl. n. 104. *Illecebrum lanatum*, L. Mant. ii. 344; Moon Cat. 19. Thw. Enum. 248. C. P. 2253.

Fl. B. Ind. iv. 728. Burm. Thes. t. 26, f. 1. Wight, Ic. t. 1776 bis, f. A (*Æ. floribunda*) and t. 1776 (analyses only).

Perennial (or annual ?), often woody at base; stems erect or prostrate, numerous, long, with slender branches, cylindrical, more or less cottony-hairy; l. alt., numerous, ¾–1¼ in. on main stem, much smaller, ¼–⅜ in., on branches, oval or spathulate-oval, tapering to base, rounded or subacute at apex, entire, finely hairy-pubescent above, more or less white with cottony hair beneath, petiole short, obscure; fl. very small, sessile, often bisexual, in very small, dense, sessile, axillary heads or spikes, bracts shorter than sep., ovate, apiculate; per.-l. 5, oval-oblong, obtuse, with membranous margins, woolly with long white hairs outside, stigmas 2, very short.

Waste and cultivated ground, a very common weed, especially in moist regions. Fl. October, &c.; greenish-white.

Throughout Tropical Asia and Africa.

Much used in native medicine as a remedy for indigestion and coughs.

3. **Æ. Monsoniæ,*** *Mart. Beit. Amarant.* 83 (1825).

Thw. Enum. 248. C. P. 3324.

Fl. B. Ind. iv. 729 (not given for Ceylon). Wight, Ic. t. 725 (not good).

Perennial, with a very long twisted tap-root, stems numerous, prostrate or ascending, quadrangular, woolly-pubescent, divaricately branched; l. opp. and in fascicles at the nodes, small, $\frac{1}{4}$–$\frac{1}{2}$ in., narrowly linear, sharply apiculate, slightly woolly, midrib prominent beneath, fl. bisexual, very small, densely crowded, spikes very numerous, $\frac{1}{2}$–1 in., shortly stalked, terminating short branchlets and arranged paniculately, narrow, bracts linear-lanceolate, acute, bractlets several, per.-l. 4, linear-lanceolate, longer than bractlets, very acute, slightly cottony on the back; stam. 4, stigma capitate; seed ovoid, slightly compressed, brown, polished.

Sandy places in the dry region near the sea, very rare. Jaffna (Ferguson); Mullaitivu (Nevill). Fl. July; pale pink.

Also in Peninsular India.

A pretty plant, worthy of cultivation.

10. ACHYRANTHES, *L.*

Herbs, l. opp., fl. small, nearly sessile, deflexed, in elongated terminal spikes, bracts deflexed, bractlets 2, above the fl., usually transformed into sharp spines; per.-l. 5, becoming hard and shining with fruit; stam. 5 or 2, connate at base, with alternating staminodes which are truncate, fimbriate, or toothed; style long, stigma capitellate, ovule solitary, pendulous from basal funicle.—Sp. 12; 4 in *Fl. B. Ind.*

Upper per.-l. longer than the rest . . . . . 1. A. AQUATICA.
Per.-l. equal
  Stam. 5.
    Per.-l. acute; staminodes fimbriate . . . 2. A. ASPERA.
    Per.-l. long-acuminate; staminodes not fimbriate 3. A. BIDENTATA.
  Stam. 2 . . . . 4. A. DIANDRA.

1. **A. aquatica,** *Br. Prodr.* 417 (1810).

Trim. in Journ. Bot. xxvii. 166.

Fl. B. Ind. iv. 730 (not given for Ceylon). Wight, Ic. t. 1780 (*Centrostachys*).

A coarse succulent herb, stem very stout, glabrous, translucent, with many slender filiform adventitious roots and long

* It is not easy to see in what respect this resembles *Monsonia*, a genus of Geraniaceæ. Name given by Linn. f. (under *Illecebrum*).

opp. branches; l. 3–5 in., lanceolate-oval, tapering to base, acuminate, acute, sparingly hairy on both sides, petiole ½–1 in.; fl. rather large (for genus), spikes rather close, 8–12 in., thick, pubescent, bracts small, acuminate, bractlets short, rotundate, membranous; sep. ¼ in., enlarged and with a much thickened base in fruit, linear-lanceolate, obtuse, glabrous, rigid, the upper (outer) one larger, mucronate, and slightly curved upwards at end; staminodes fimbriate, fruit nearly globose.

In shallow water in the dry region, very rare. Side of tank at Madatugama, N. Central Prov. Fl. July.

Also in India, Burma, and Trop. Africa.

2. **A. aspera,** *L. Sp. Pl.* 204 (1753). **Gas-karal-héba,** *S.* **Náyuruvi,** *T.*

Herm. Mus. 20. Burm. Thes. 16. Moon Cat. 18. Thw. Enum. 249. C. P. 2243.

Fl. B. Ind. iv. 730. Burm. Thes. t. 5, f. 3. Wight, Ic. t. 1777.

Stem 1–2 ft., erect, stiff, with few long spreading branches, cylindrical, thickened above nodes, striate, pubescent; l. few, on very short petioles, obovate or oval, tapering to base, usually rounded, sometimes acute at apex, entire but often very undulate, usually finely and softly pubescent on both sides; fl. numerous, stiffly reflexed against rachis, densely crowded, spikes slender, attaining 12–15 in. in front, woolly-pubescent, bracts short, reflexed, ovate, membranous, with a long very acute point, bractlets very sharply spinescent (very hard with fruit), with a broad membranous wing at base; per.-l. about ⅛ in., oblong-oval, acute, glabrous and shining, with a narrow white membranous margin; stam. 5, staminodes large, truncate, fimbriate; fruit very small, oblong-cylindrical, truncate, nearly smooth, brown, enclosed in hardened per.

Var. β, **argentea,** *Hk. f.* *A. argentea*, Thw. Enum. 249 (? Lam.). C. P. 2909.

L. white, silky-pubescent on both sides.

Waste land and in grass, a very common weed. Var. β, Kalutara (Moon). Fl. Oct.–Dec., &c.; greenish-white.

Throughout the Tropics.

The hardened perianth containing the fruit disarticulates from the rachis above the bract, carrying away with it the spinescent bractlets by which it becomes attached to other objects and is transported.

There is only a single specimen of var. β in Herb. Perad., and that a very poor one. Thwaites quotes for it *A. rubrofusca*, Wight, Ic. t. 1778.

Diuretic and purgative, much used in native medicines.

3. **A. bidentata,** *Bl. Bijd.* 545 (1825).

Thw. Enum. 249. C. P. 730.

Fl. B. Ind. iv. 730. Wight, Ic. t. 1779.

Stem tall, 2–4 ft., thickened at nodes, slightly hairy, with long opp. branches; l. 2–4 in., lanceolate, acute at base, acuminate, acute, often finely undulate at margin, slightly hairy on both sides; fl. laxly reflexed, not crowded, spikes slender, weak, pubescent, bracts short, linear, acute, deflexed, bractlets entirely transformed into very sharp stiff spines with 2 minute rounded auricles at base; per.-l. under $\frac{1}{4}$ in., very acuminate; stam. 5, staminodes not fimbriate.

Shady places in grass, common, especially in the lower montane zone. Fl. Sept.–Jan.; greenish.

Also in India, China, Japan, and Java.

4. **A. diandra,** *Roxb. Fl. Ind. (ed. Carey & Wall.)* ii. 504 (1824). *Centrostachys diandra*, Wall., Thw. Enum. 249. C. P. 2241.
Fl. B. Ind. iv. 731. Wight, Ic. t. 722.

Annual, stems about 2 ft., very slender, slightly hairy; l. very shortly stalked, $1\frac{1}{2}$–3 in., linear or lanceolate-linear, acute at both ends, slightly hairy on both sides; fl. deflexed, very lax or distant, spikes extremely slender, slightly hairy, bracts small, reflexed, bractlets transformed into slender sharp spines nearly as long as fl., per.-l. scarcely $\frac{1}{6}$ in., very acute; stam. 2, staminodes shortly fimbriate; fruit oblong, truncate.

Dry region; common. Fl. January–March.

Endemic.

I do not know who first detected this. Roxburgh simply gives 'Ceylon' as the locality.

11. ALTERNANTHERA, *Forsk.*

Prostrate herb, l. opp., fl. sessile in axillary sessile heads; per.-leaves 5, slightly unequal, scarious; perfect stam. 3 (or 2) and staminodes 2 (or 3), all united at base to form a short cup, anth. 1-celled; ov. compressed, with a solitary ovule pendulous from basal funicle; stigma sessile.—Sp. 16; 2 in *Fl. B. Ind.*

A. triandra, *Lam. Ency. Méth.* i. 95 (1783). **Mukunuwenna,** *S.*
Herm. Mus. 14. Burm. Thes. 17. Fl. Zeyl. n. 116. *Illecebrum sessile*, L. Sp. Pl. ed. 2, 300. Moon Cat. 19. *A. sessilis*, Br., Thw. Enum. 250. C. P. 2908.
Fl. B. Ind. iv. 731 (*A. sessilis*). Burm. Thes. t. 4, f. 2. Wight, Ic. t. 727.

Stems numerous, 6–24 in., with long internodes, prostrate or ascending, often rooting at lower nodes, sub-quadrangular, glabrous, the younger ones with two opp. lines of hair, often purple; l. small, $\frac{3}{4}$–2 in., varying from linear to oblong-oval,

nearly sessile, tapering to base, subacute, very faintly serrate, glabrous; fl. densely crowded, heads very small, sometimes slightly spicate.

Wet places in the low country; very common, especially round tanks and ponds. Fl. all the year; white.

In all Tropical and warm countries.

This is eaten as a vegetable.

CIV.—CHENOPODIACEÆ.

HERBS or undershrubs, l. alt. or opp., often fleshy or 0; fl. small, regular, bisexual or unisexual, sessile, axillary with or without bracts; perianth-segm. 3 or 5, distinct or connate, imbricate, persistent (fleshy in *Basella*), rarely 0; stam. 5 or 1, anth. 2-celled; ov. superior, 1-celled, with a single basal or lateral ovule, styles 2 or 3; fruit a membranous utricle enclosed in persistent perianth; seed horizontal or vertical, with a flat, curved, or spiral embryo, with or without endosperm.

Stems not twining.
  Fl. unisexual . . . . 1. ATRIPLEX.
  Fl. bisexual (except sometimes in 4).
    Leafless; stam. 1.
      Embryo curved round endosperm . 2. ARTHROCNEMUM.
      Embryo bent double; no endosperm . 3. SALICORNIA.
    Leafy; stam. 5. . . . . . . 4. SUÆDA.
Stems twining. . . . . 5. BASELLA.

All our species except *Basella* are plants of the seashore.

1. ATRIPLEX, *L.*

Shrubby, l. opp., fleshy, fl. small, unisexual, monœcious, in interrupted spikes; male fl. without bracts, per.-leaves 5; stam. 5; fem. fl. with 2 large flat opp. bracts becoming much enlarged in fruit, perianth 0, stigmas 2, utricle small, membranous, completely enclosed by the thickened bases of the persistent bracts; embryo annular, endosperm starchy.—Sp. 100; 5 in *Fl. B. Ind.*

A. repens, *Roth. Nov. Sp. Pl.* 377 (1821). **Elichchevi,** *T.*
A. coriacea, Moon Cat. 72 (non Forsk.). Thw. Enum. 246. C. P. 2252. Fl. B. Ind. v. 7. Wight, Ic. t. 1790 (*Obione Kœnigii*).

A small shrub, stems prostrate or ascending, sub-quadrangular, somewhat thickened at nodes, bark yellowish grey,

when young covered with white scaly pubescence; l. numerous, small, $\frac{1}{2}$–$\frac{3}{4}$ in., oval or oblong-oval, acute at base, rounded or emarginate at apex, entire, completely covered on both sides with a layer of minute white shining scales, petiole very short, obscure; fl. sessile, in small clusters on short interrupted terminal spikes sometimes branched at the base; bracts and perianth covered with white scaly coating, bracts in fruit $\frac{1}{3}$ in., somewhat connate at base, roundish, toothed, smooth or with warty prominences on back; seed ovoid, compressed, brown, shining.

Sandy seashores in the dry region; rather common. Jaffna, abundant; Neduntivu (Delft) Is.; Kalpitiya; Karativu I. Fl. February, August, &c.

Also in S. India and Persia.

The Tamils of Jaffna eat this as a vegetable.

Chenopodium murale, L., has occasionally occurred as a casual weed about Kandy (Moon) and at Trincomalie (Glenie, C. P. 3658). It is included in Thw. Enum. 246, but has no claims to nativity here.

C. ambrosioides, L., a tall, erect plant, strongly aromatic, is a common weed in Dimbula and some other up-country districts. It is a recent introduction, probably during the construction of the railway, and first noticed in 1882. Well figured in Wight, Ic. t. 1786; its native country is doubtful.

C. opulifolium, Schrad., has occurred as a weed near Kandy.

2. ARTHROCNEMUM, *Moq.*

Perennial, somewhat shrubby, leafless, fleshy, jointed, fl. minute, bisexual, 2 or 3 together in axils of fleshy imbricated scales forming short stout cone-like spikes; perianth obpyramidal, truncate, spongy; stam. 1; styles 2; utricle membranous, enclosed in thickened perianth; seed solitary, compressed, smooth, embryo curved half round farinaceous endosperm.—Sp. 7 or 8; 2 in *Fl. B. Ind.*

A. indicum, *Moq. Chenopod. Enum.* 113 (1840). **Kotanai,** *T.*
Salicornia indica, Willd., Moon Cat. 2. Thw. Enum. 246. C. P. 2262. Fl. B. Ind. v. 12. Wight, Ic. t. 737 (*Salicornia indica*).

Stems usually prostrate, with a woody core, branches erect or ascending, jointed, very fleshy, with many short branches, joints $\frac{1}{3}$–$\frac{1}{2}$ in., broad, thick, dilated and 2-toothed at summit; spikes $\frac{1}{2}$–$\frac{3}{4}$ in., wider than joints, cylindrical, blunt, bracts spongy; seed triangular, much compressed, testa thin, crusta ceous, yellow.

Seacoast, in places occasionally flooded by the tide in the dry districts; common. Abundant about Jaffna. Fl. December–February.

Also in India and Trop. Africa.

The figure of Wight represents the plant in flower; when in fruit, the spikes are much broader and cone-like. The Ceylon plant is apparently referred in Fl. B. Ind.* to *A. glaucum*, Ung.-Sternb., which I do not clearly distinguish by the description given.

3. SALICORNIA, *L.*

Semi-shrubby, leafless, fleshy, jointed, fl. minute, bisexual, 3 together, sunk in excavations at base of joints forming long spikes; fl. and fruit much as in *Arthrocnemum;* seed solitary, compressed, hispid, embryo bent double, endosperm 0.—Sp. 8; 1 in *Fl. B. Ind.*

S. brachiata, *Roxb. Fl. Ind.* (*ed. Carey & Wall.*) i. 82 (1824).
Thw. Enum. 443. C. P. 3855.
Fl. B. Ind. v. 12. Wight, Ic. t. 738.

Stem 8–12 in., more or less erect, very much branched, joints $\frac{1}{4}$–$\frac{1}{2}$ in., rather slender, slightly dilated and 2-toothed at top; spikes 2–3 in., slender, cylindrical; seed pale brown, hispid with white hair.

Seacoast, in places occasionally flooded by the tide in the dry district; rather rare (?). Near Jaffna; Hambantota and Kirinda, round the lewayas (salt-pans). Fl. December–February.

Also in Peninsular India.

Distinguished from *Arthrocnemum* by its more slender erect habit and much narrower fl.-spikes.

4. SUÆDA, *Forsk.*

Shrubby (? sometimes annual), l. alt., fleshy, fl. minute, usually bisexual, sessile, with 3 bracts at base, in axillary clusters; perianth-segm. 5, inflexed at apex; stam. 5, short; styles 2 or 3; utricle membranous, seed black, polished, embryo coiled in a flat spiral, endosperm scanty or 0.—Sp. 40; 6 in *Fl. B. Ind.*

Stem. erect; spikes slender, lax; bracts entire.
  L. linear; floral ones short . . . 1. S. MONOICA.
  L. narrowly linear; floral ones very short . 2. S. MARITIMA.
Stem. prostrate; spikes dense, crowded; bracts serrate . . . . . 3. S. NUDIFLORA.

1. **S. monoica,** *Forsk. Fl. Ægypt.-Arab.* 70 (1775).
S. indica, Thw. Enum. 246 (? Moq.). *Salsola indica*, Willd., Moon Cat. 21. C. P. 2260.
Fl. B. Ind. v. 13. Wight, Ic. t. 1792 (good).

A small erect bush, branches numerous, ascending, marked

* Thw. Enum. 246 is also there quoted by error under *Salicornia brachiata.*

with prominent leaf-scars, bark vertically cracked; l. very numerous, sessile, $\frac{1}{2}$–$\frac{3}{4}$ in., linear, fleshy, blunt or apiculate, bright green; spikes slender, very lax, clusters distant, each in axil of a short leaf, bracts minute, entire.

Tidal flats on the coast of the dry region; common and gregarious. Fl. December–March, August.

Also in S. India, Arabia, Trop. Africa.

Thwaites erroneously quotes Wight, t. 1796, for this; hence in Fl. B. Ind. his *S. indica* is given under *S. nudiflora*, but the C. P. specimens are the present species. This is erect, and often forms a largish bush, and the leaves are bright green, which distinguishes it at sight from *S. nudiflora*, with which it generally grows intermixed.

2. **S. maritima,** *Dumort. Fl. Belg.* 22 (1827).
Trim. in. Journ. Bot. xxiii. 173.
Fl. B. Ind. v. 14. Wight, Ic. t. 1793 (*Chenopodina indica*).

Annual (?), stems woody at base, erect, $1\frac{1}{2}$–2 ft., with numerous very slender erect branches; l. numerous, $\frac{3}{8}$–$\frac{5}{8}$ in., narrowly linear, fleshy, subacute, spikes very slender, elongated, lax, clusters small, few-flowered, globose, each in axil of a very short leaf, bracts entire; seeds very small.

Sandy seacoast; rather common? Jaffna, abundant; Kirinda, by the salt-pans; Kalpitiya. Fl. December, January.

Also in India, N. and W. Asia, N. Africa, Europe, N. America.

Our form has very slender, erect branches and much shorter floral leaves than as figured in Wight's plate quoted.

3. **S. nudiflora,** *Moq. in Ann. Sc. Nat.* xxiii. 316 (1831).
Umiri, *T.*
Salsola nudiflora, Willd., Moon Cat. 21. Thw. Enum. 246. C. P. 2261.
Fl. B. Ind. v. 14. Wight, Ic. t. 1796 (*S. indica*).

Shrubby, stems prostrate, much branched, bark smooth, yellowish, l. numerous but quickly falling, $\frac{3}{8}$–$\frac{5}{8}$ in., broadly linear, at first flattish, afterwards semicylindrical, blunt, glaucous-green; spikes rather thick, clusters approximated or crowded, dense, globose, many-flowered, only a few of the lowest in the axil of a l., bracts serrate or pectinate.

Tidal flats on the coast in the dry region; very common, gregarious. Fl. December–March.

Also in Peninsular India.

This is usually more abundant than *S. monoica*, and the two species occur mixed and cover miles of the flat coast on the N.E. of Ceylon. This is a coarse-looking, prostrate or spreading plant of a glaucous-green, the full-grown leaves succulent and semicylindrical. The clusters are often confluent in fruit, forming close leafless spikes.

5. BASELLA,* *L.*

Succulent perennial twining herb, l. alt, fl. bisexual, in

* The Malabar (Telegu) name as given by Rheede.

axillary spikes, with 2 large fleshy bractlets adnate to perianth, perianth fleshy (becoming berry-like with fruit), segm. 5, short, incurved; stam. 5, included, anth. small, versatile; styles 3, erect, stigmas clavate; utricle completely enclosed in enlarged fleshy perianth; seed nearly globose, embryo coiled in a flat spiral, endosperm scanty.—Monotypic.

B. rubra, *L. Sp. Pl.* 272 (1753). **Niviti,** *S.* **Pasalai,** *T.* Herm. Mus. 68. Fl. Zeyl. n. 119. Moon Cat. 23. Thw. Enum. 246. Fl. B. Ind. v. 20. Wight, Ic. t. 896 (*B. alba*).

Perennial herb, stems very long, slender, twining succulent, glabrous, much branched; l. 2–4½ in., broadly ovate, often subcordate at base, subacute, apiculate, entire, thick, brittle, glabrous and shining, petiole short, very thick; fl. sessile, few, in short lax pedunculate spikes, basal bracts small, apiculate, adnate, bractlets rather longer than perianth, oblong, obtuse; per.-segm. broadly oval, obtuse.

Forests and shady places in the dry region; rather rare. Puttalam; Tissa-maha-rama, S. Prov. Fl. December, &c.; pinkish-white.

Throughout Tropical Asia and Africa, wild or cultivated.

This appears to be a native in the dry region; it is the green variety (*B. alba*, L.). Red and purple and white-stemmed forms are much grown in gardens as pot-herbs, and are often called 'spinach' by the English.

Rivina humilis, L. (*R. lævis*, L.), is a common garden weed, and is found quite naturalised in waste ground in the low country. It is native to Trop. America, and *R. orientalis*, Moq., is the same. It is C. P. 1899 and Moon Cat. 12, and is used as a febrifuge medicine in the N. Prov.

Mohlana nemoralis, Mart., a native of Trop. America and Africa, has occurred apparently quite wild at Lagalla and Uma-oya.

Phytolacca octandra, Moq., of Trop. America, is said by Thwaites (Enum. 250) to occur occasionally as an escape from gardens. This and the two last-mentioned belong to the Order *Phytolaccaceæ*.

CV.—POLYGONACEÆ.

Annual or perennial herbs (occasionally semi-shrubby), l. alt., stip. combined into a tubular membranous sheath (ocrea), fl. small, regular, bisexual (very rarely unisexual), usually jointed on ped., in small bracteate clusters in spike-like or capitulate infl.; perianth deeply 4- or 5-lobed, lobes imbricate; stam. 4, 5, or 8 inserted on perianth (perigynous);

ov. superior 1-celled, with a solitary basal ovule, styles 2 or 3; fruit a small nut enclosed in persistent perianth, trigonous or bi-convex; seed with small embryo lateral in endosperm.

Mostly low-country weeds, but two species, *P. minus* and *P prætermissum*, are found only in the hills. We have no endemic species.

POLYGONUM, *L.*

For characters, see Order.—Sp. about 150; 70 in *Fl. B. Ind.*

Stems glabrous, rarely pubescent.	
Fl. in spike-like racemes.	
L. pubescent on both sides . .	1. P. TOMENTOSUM.
L. glabrous, often asperous.	
Stip. not ciliate	2. P. GLABRUM.
Stip. more or less ciliate.	
Stip. ½ in., cilia much shorter than tube	3. P. MINUS.
Stip. over ¾ in., cilia as long as tube.	
Stip. 1½ in.	4. P. BARBATUM.
Stip. ¾ in.	5. P. SERRULATUM.
Fl. in heads.	
Small annual herb	6. P. PUNCTATUM.
Large semi-scandent shrub . .	7. P. CHINENSE.
Stems with recurved prickles below nodes.	
Fl. distant, l. strongly sagittate at base	9. P. PRÆTERMISSUM.
Fl. close.	
L. truncate or slightly auriculate at base.	8. P. STRIGOSUM.
L. tapering to base. . . .	10. P. PEDUNCULARE.

1. **P. tomentosum,** *Willd. Sp. Pl.* ii. 447 (1799). **Sudu-kimbulwenna,** *S.*
Moon Cat. 32. Thw. Enum. 246. C. P. 2248.
Fl. B. Ind. v. 30.

Stems often prostrate below and rooting at nodes, above erect, stout, glabrous or pubescent; l. rather large, 4–8 in., linear-lanceolate, the lowest ones sometimes ovate, much tapering at both ends, very acute, entire, silky-pubescent on both sides, sometimes white and velvety, petiole very short (sometimes long in lower l.) stip. ¾–1 in., hairy, mouth truncate, ciliate with fine bristly hairs ¼ in. long; fl. on short ped., racemes few, panicled, erect, 1½–2½ in., slender, bracts large, very truncate, hairy, ciliate; fruit ⅛ in., orbicular, somewhat compressed, black, shining.

Ditches, borders of tanks, &c., in the low country, especially the dry region; common. Fl. all the year; white.
Also in India, Malaya, Philippine Is., Trop. and S. Africa.

2. **P. glabrum,** *Willd. Sp. Pl.* ii. 447 (1799).
Thw. Enum. 245. C. P. 2907.
Fl. B. Ind. v. 34. Wight, Ic. t. 1799.

Stems 2–5 ft., stout, slightly branched, somewhat swollen above nodes, glabrous and shining, purplish-red; l. usually large, 8–10 in., linear-lanceolate, much tapering to both ends, entire, glabrous or slightly rough with minute prickles, midrib prominent, broad, lat. veins numerous, pellucid, petiole very short, stout, stip. about 1 in., membranous, veined, truncate, not ciliate; fl. numerous, on short glabrous ped., racemes 1–3 in., erect, bracts short, truncate, glabrous; perianth-segm. broadly oval, acute, stam. usually 8 (sometimes fewer), shorter than per.; styles 2, divergent, stigmas globose; fruit.

In wet places in the low country; common. Fl. all the year; bright pink.

Throughout the Tropics.

Very like the European *P. Persicaria*, but much larger. The leaves are quite glabrous, but often slightly rough with minute asperities, and thickly gland-dotted on both surfaces (= var. *scabrinervis*, Hk. f.).

3. **P. minus,** *Huds. Fl. Angl.* 148 (1762).
P. Posumbu, Thw. Enum. 245 (non Ham.). C. P. 2591.
Fl. B. Ind. v. 36. Wight, Ic. t. 1800 (*P. strictum*).

Stems 9–12 in., decumbent and rooting at base, then erect, slender, glabrous, slightly branched; l. sessile, 1½–2½ in., narrowly oblong-lanceolate, tapering to both ends, subacute, glabrous, very slightly rough beneath, stip. about ½ in., truncate, nearly glabrous, ciliate with bristly hairs; fl. few, racemes small, lax, very slender, about 1 in., bracts pectinate; perianth glabrous, without glands; styles 2; fruit very small, broadly ovoid, compressed, brown, shining.

Montane zone; rare. Dimbula about 4000 ft. (Thwaites). Fl. April.

India, Temp. and Trop. Asia, Europe (an English plant).

4. **P. barbatum,** *L. Sp. Pl.* 362 (1753). **Ratu-kimbul-wenna,** *S.*
Moon Cat. 32. Thw. Enum. 245. C. P. 3000.
Fl. B. Ind. v. 37. Wight, Ic. t. 1798.

Stems 1½–3 ft., erect, glabrous; l. numerous, 5–6 in., linear-lanceolate, nearly sessile, tapering to both ends, acute, finely hairy on both sides and at margin, stip. 1½ in., usually longer than internode, strigose with long hair, ciliate with strong coarse hair as long as tube; fl. on short slender ped., racemes 1½–2 in., erect, slender, rather lax, bracts strongly pectinate; perianth without glands, styles 3; fruit triangular, black, shining.

Wet places in the low country; common in the moist region. Fl. all the year; white.

Throughout Trop. Asia and Africa.

5. **P. serrulatum,** *Lagasca, Nov. Gen. & Sp.* 14 (1816).
Thw. Enum. 245. C. P. 2999.
Fl. B. Ind. v. 38 (not given for Ceylon).

Annual, stems prostrate at base and rooting at the nodes, then erect, 2–4 ft., slender, thickened above nodes, glabrous; l. sessile, 2–3 in., linear-lanceolate, tapering to both ends, acute or slightly rounded at base, acute, glabrous except for a row of bristly hairs on margin, stip. ¾ in., nearly glabrous, bristles few, stiff, as long as tube; fl. small on slender ped., racemes ¾–2 in., slender, erect, bracts truncate, glabrous, with long often spreading cilia; perianth without glands; fruit trigonous, black, shining.

Moist low country, very rare (?). Galle (Thwaites). Fl. Dec.; white.

All Tropical and warm countries.

[*P. flaccidum*, Meisn., is given for Ceylon in Fl. B. Ind. v. 39; and *P. Posembu*, Thw. Enum. (see *P. minus*) is quoted for it. Wight, Ic. t. 1801 (*P. Donii*) is also quoted for this, which figure is unlike any species known to me in Ceylon.]

6. **P. punctatum,** *Ham. in Don, Prod. Fl. Nep.* 72 (1825).
P. perforatum, Meisn., Thw. Enum. 246. C. P. 2251.
Fl. B. Ind. v. 41 (*P. alatum*). Wight, Ic. t. 1804 (*P. nepalense*).

Annual, stems numerous, erect, spreading or prostrate, with many ascending branches, glabrous, succulent, purple; l. sessile, small, ½–1½ in., deltoid-ovate, but narrowed below, slightly amplexicaul and auriculate at base, acute or subacute, glabrous except the pilose margin, gland-dotted beneath, stip. short, membranous, obliquely truncate, without cilia, with a tuft of white hair at base; fl. small, sessile, polygamous (fem. and bisexual) crowded in small globose apparently terminal heads, peduncles really leaf-opposed, very short, glandular-hairy at top, bracts broadly ovate, with membranous margins or all membranous; perianth (in bisexual fl. compressed below and broadly wringed) 4-lobed, segm. oval, acute; stam. 4–8, included, stigmas 2 or 3; fruit oval, compressed or trigonous, finely shagreened.

Moist region up to 6000 ft., mostly in the montane zone; a common weed in cultivated ground. Fl. all the year; pink or white.

Mountains of India, Java, Affghanistan, Japan, Abyssinia.

A very common weed on the estates in the hills. Our usual form is small and prostrate or diffuse, with the nuts biconvex, and agrees well with the figure of Wight's above quoted.

7. **P. chinense,** *L. Sp. Pl.* 363 (1753).
Moon Cat. 32. Thw. Enum. 246. C. P. 2249.
Fl. B. Ind. v. 44. Wight, Ic. t. 1806.

A large scrambling shrub, semi-scandent over trees and bushes by its very long divaricate branches which are cylindrical, slightly swollen at the nodes, glabrous and shining, young parts glabrous; l. numerous, $2\frac{1}{2}$–$4\frac{1}{2}$ in., oval or ovate-oval, shortly petioled, the uppermost sessile, suddenly tapering to base, shortly acuminate, acute, entire, glabrous except on prominent midrib which is hispid beneath, stip. very long (often nearly 2 in.), membranous, very obliquely truncate, lanceolate, acute; fl. sessile, crowded in small globose heads arranged in terminal corymbs, peduncles usually glandular-pubescent, bracts small, acute, with stip.; per.-segm. ovate, subacute, erect; fruit large, trigonous, closely invested by fleshy persistent perianth.

Moist region up to 7000 ft. principally in the montane zone, common. Fl. all the year; pinkish-white.

India, Burma, Malaya, China, Japan.

The leaves have often a broad horseshoe-shaped blackish stain on the lower part of upper surface.

8. **P. strigosum,** *Br. Prod.* 420 (1810).

P. pedunculare, Thw. Enum. 246 (non Wall.). *P. strigosum*, var. *horridum*, Trim. Syst. Cat. Ceyl. 73. C. P. 3348.

Fl. B. Ind. v. 47.

Stems 1–3 ft., erect, rather slender, angular, glabrous with the angles below each node set with small recurved sharp prickles; l. 2–3 in., on short petiole, oblong-lanceolate, acute or truncate, often slightly auriculate at base, subacute, glabrous except slightly prickly margin, stip. $\frac{3}{4}$ in., split, with finely scabrous parallel veins, obscurely ciliate, with a ring of recurved prickles at base; fl. few, sessile, crowded, spikes very small, $\frac{1}{6}$–$\frac{1}{3}$ in., bracts ovate, ciliate, fruit not seen.

Moist region up to 6000 ft., rare. Colombo (Ferguson); Kalutara; Nuwara Eliya. Fl. Aug., Dec.; pink.

India, Burma, Malaya, China.

9. **P. prætermissum,** *Hk. f. in Fl. B. Ind.* v. 47 (1886).

P. strigosum, Thw. Enum. 246 (non Br.); Trim. Syst. Cat. Ceyl. 73. C. P. 2250.

Fl. B. Ind. v. 47.

Perennial with short horizontal stolons from lower nodes, stems prostrate or ascending, rooting below, 12–18 in., slender, glabrous with a few weak prickles below the nodes, red; l. small, 1–2 in., linear or oblong, strongly sagittate at base with long obtuse lobes, obtuse at apex, glabrous, the lower ones often oval with cordate base, petiole $\frac{1}{8}$–$\frac{1}{3}$ in., stip. $\frac{1}{2}$ in., very obliquely truncate, not ciliate, slightly bristly; fl. small, few, distant, on short ped., racemes or panicles leaf-opposed

(uppermost one apparently terminal) divaricate, glabrous or slightly glandular, bracts broad, truncate, ciliate; fruit rather large, bluntly trigonous, dull black.

Upper montane zone, rather common. In streams at Nuwara Eliya, abundant; Horton Plains. Fl. Feb.; pink.
Also on Himalaya Mountains and in Tasmania.

10. **P. pedunculare,** *Wall. Cat. n.* 1718 (1828).
Fl. B. Ind. v. 48. Wight, Ic. t. 1802, f. c.

"Stem 1–2 ft. ascending, glabrous, quite smooth except a few recurved prickles at the nodes and sometimes on the angles; l. 1–2 in., petioled, elliptic-lanceolate or ovate, acuminate at both ends; racemes panicled, oblong or globose, peduncles and bracts glabrous or glandular-pubescent, bracts acuminate, ciliate; nut orbicular, biconvex."

Ceylon, Walker. (Fl. B. Ind. l. c.)
India, Trop. Asia generally, China, Australia. Common on the Nilgiri Mountains.
I do not know this as distinct from *P. strigosum*, and the above description is taken from *Fl. B. Ind.*

Rumex obtusifolius, L., the Broad-leaved Dock, and *R. crispus*, L., the Curled Dock, are found by roadsides about Nuwara Eliya; introduced from England.

R. acetosella, L., the Sheeps' Sorrel, is also commonly found in similar places there, no doubt introduced with grass seed from Europe.

CVI.—PODOSTEMONACEÆ.

Perennial submerged aquatic herbs, stems fleshy, more or less flattened dilated and thallus-like, closely attached to rocks or elongated, l. small, usually in fascicles, deciduous, fl. small, bisexual, solitary, with a few bracts and a short spathe at base; perianth of 3 segm. or 0; stam. 1–3, usually 2 with fil. connate for more than half way, hypogynous, staminodes 2 or 0; ov. superior 2-or 3-celled, with numerous ovules, styles 2 or 3; capsule dry, dehiscing septicidally into 2 or 3 valves; endosperm 0.

A small order of Tropical aquatics of a very reduced type of growth, and of undecided affinities. Suggested relationships are found with *Saxifragaceæ*, *Caryophyllaceæ*, *Scrophulariaceæ*, *Lentibulariaceæ*, *Elatineæ*, *Nepenthaceæ*. Of our 6 species, 4 appear to be endemic. All (but *P. metzgerioides*) have been exhaustively figured, from Ceylon material, in Warming's series of memoirs quoted below.
These little plants simulate mosses or hepatics in their general

appearance. They grow intermixed on rocks in rapid streams, and for the greater part of the year are entirely submerged. In the dry season, when the level of the water falls, they become uncovered and the flowering and fruiting occurs.

Perianth 3-leaved; stam. 3 . . . 1. LAWIA.
Perianth 0; stam. 2, rarely 1 . . . 2. PODOSTEMON.

1. LAWIA,* *Griff.*

Thallus confluent into a flat frond with dilated flabelliform lobes; l. in fascicles, linear, fl. solitary, bisexual, pedicellate, ped. surrounded at base with a short bristly spathe; perianth-segm. 3, slightly imbricate; stam. 3; ov. 3-celled (but septa sometimes absent), ovules numerous, placentas thick, styles 3, feathery; capsule septicidally 3-valved.—Sp. 7; all in *Fl. B. Ind.*

L. zeylanica, *Tul. in Ann. Sc. Nat. ser.* 3, xi. 112 (1849).
Tristicha zeylanica, Gardn. in Calc. Journ. Nat. Hist. vii. 177. *Terniola zeylanica*, Tul. Mon. Podost. 190; Trim. Syst. Cat. Ceyl. 73. *Dalzellia*† *zeylanica*, Wight, Ic. v., pt. 2, 35; Thw. Enum. 223. C. P. 3809.
Fl. B. Ind. v. 62 (*Terniola*). Wight, Ic. t. 1919, f. 1 (*Tulasnea zeylanica*). Warming in Vidensk. Selsk. Skr. Kiobenh. vii. 4, ff. 27–30.

Frond very thin, closely adherent to the subjacent rock, wide-spreading, much-branched, pale green becoming olive-brown, shining; l. very small, in minute star-like tufts, linear-strap-shaped, obtuse; spathe fleshy, densely covered with short softly spinous processes, ped. twice as long as fl., perianth-segm. nearly distinct, oblong-lanceolate, acute; stam. as long as segm., capsule ovoid-oblong, 9-ribbed.

On rocks in swift-running water, rare. Abundant on water-worn blocks in the Mahaweli River a little below Peradeniya Gardens at about 1600 ft.; Haragama, lower down on the same river; stream below Lagalla, Matale East. Fl. Jan., Feb.; pinkish-white.

Endemic.

Extremely like a moss when in fruit, but the frond or mature 'thallus' resembles that of a lichen.

2. PODOSTEMON, *Mich.*

Thallus or frond various, floating or attached to subjacent rock, cylindrical, dilated, or ribbon-like, l. small, in fascicles or imbricate, deciduous (or none?); fl. solitary, each surrounded

---

* Commemorates J. S. Law of the Bombay Civil Service. Wight's previous genus of the same name is reduced to *Adenosachme*.

† Dedicated to N. A. Dalzell, M.A., of the Bombay Medical Establishment.

by a few bracts (except in *P. subulatus*) and a membranous spathe; perianth 0; stam 2, with the fil. connate for more than half way (only 1 in *P. metzgerioides*), staminodes 2, filiform; ov. 2-celled, ovules numerous, styles 2; capsule elevated on a ped., ovoid, 2-valved, but often with only 1 valve deciduous.—Sp. 20; 14 in *Fl. B. Ind.*

Stam. 2, fil. connate.
  Fronds long, floating under water; l. minute (*Dicræa*)
    Frond slender, cylindrical . . . . 1. P. ELONGATUS.
    Frond flat, broad . . . . 2. P. ALGÆFORMIS.
  Frond filiform, creeping; l. large . . . 3. P. SUBULATUS.
  Frond dilated, membranous; l. none? (*Hydrobryum*) . . . . 4. P. OLIVACEUS.
Stam. 1; frond creeping, ribbon-like (*Mavælia*) . 5. P. METZGERIOIDES.

1. **P. elongatus,** *Gardn. in Calc. Journ. Nat. Hist.* vii. 188 (1846).
Dicræa elongata, Tul. in Ann. Sc. Nat. l. c. 102; Thw. Enum. 222. C. P. 2259.
Fl. B. Ind. v. 65. Wight, Ic. t. 1917, f. 1. Warming in Vidensk. Selsk. Sk. Kiobenh. vi. 2, tt. 10, 11.

Fronds numerous, long, 6–24 in., stem-like, often connected at base, submersed, slender, cylindrical, scarcely branched, coriaceous, olive-green; l. very small, numerous, in fascicles on the upper portion of the fronds above the fl., $\frac{1}{4}$ in., linear-setaceous; fl. in 2 rows, distant, on lower part of the fronds or on special shorter fronds, each surrounded at base with 3 or 4 small acute bracts and a tubular bilobed spathe, at first sessile, but with ped. gradually lengthening to $\frac{1}{5}$ in. in fruit, fil. connate nearly to summit, staminodes as long as ov., stigmas short, thick; capsule oblong-ovoid, strongly 8-ribbed.

Rocks in streams and rivers, rare. Masnawatte stream, Ambagamuwa (Gardner); Mahaweli River below Peradeniya Gardens; Kelani River at Kitulgala. Fl. Feb., March.

Endemic.

Our largest species, the slender fronds forming long streaming masses in the water.

2. **P. algæformis,** *Trim. in Journ. Bot.* xxiii. 173 (1885).
Trim. Syst. Cat. Ceyl. 73.
Fl. B. Ind. v. 65. Bedd. in Trans. Linn. Soc. xxv. t. 24 (*Dicræa algæformis*).
Warming, l. c. t. 12, f. 3–29.

Fronds 3–9 in., submerged, flattened, hard-fleshy, irregularly cut into long linear segments which are again laciniate crenate undulate and obtuse, olive-green; l. very few, usually in pairs from little cavities at edge of upper part of frond, under $\frac{1}{8}$ in.; fl. rather crowded, distichous on lower part of

frond, bracts thick, fleshy, truncate, spathe membranous, ped. quickly elongating; fil. connate $\frac{2}{3}$ up, staminodes shorter than ov., capsule ovoid, obtuse, 8-ribbed, ped. $\frac{3}{8}$ in. long.

Rocks in rivers, very rare. Mahaweli River below Peradeniya, and at Haragama below Kandy. Fl. Feb.

Also on Anamalai Mountains, S. India.

Remarkably like an olive seaweed, and very variable in the form of the fronds.

3. **P. subulatus,** *Gardn. in Calc. Journ. Nat. Hist.* vii. 184 (1846). Tul. Mon. Podost. 135. Thw. Enum. 222. C. P. 3088, 3366.

Fl. B. Ind. v. 65. Wight, Ic. t. 1918, f. 1. Warming, l. c. vi. 4, tt. 19, 20.

Frond filiform, slender, creeping, dichotomous, sending up numerous erect thick branches which are flattened, concave on one surface and convex on the other, and about $\frac{1}{2}$ in. high, often widened at top and rarely branched; l. very numerous, closely imbricate on the branches, long, 2–5 in., filiform, very acute, cylindrical above, sheathing at base, and many hollowed out there into a cavity containing the fl.; fl. numerous, crowded, bracts 0, spathe tubular, lacerate; fil. much longer than ov., connate for $\frac{3}{4}$ length, staminodes as long as ov.; capsule oblong-ovoid, acute, 8-ribbed, on ped. $\frac{1}{4}$ in. long.

On stones and rocks in rivers, rare. Mahaweli River, near Navalapitiya (Holnicut Est.); Ambagamuwa (Gardner); Roxawa, Dolosbagie (Thwaites); Mahaweli, at Hakinda below Peradeniya, abundant. Fl. Jan., Feb.

Endemic.

Known by its tufts of long imbricate leaves (or bracts), which are, however, withered before the capsules are ripe, when the plant has a quite different appearance.

4. **P. olivaceus,** *Gardn. in Calc. Journ. Nat. Hist.* vii. 181 (1846). *Hydrobryum olivaceum*, Tul. in Ann. Sc. Nat. l. c. 104; Thw. Enum. 223. C. P. 3065.

Fl. B. Ind. v. 66. Wight, Ic. t. 1918, f. 2. Warming, l. c. vii. 4, ff. 31–34.

Frond continuous, thin, closely attached to subjacent rock, shining, olive-green; l. none (?); fl. numerous, scattered over the surface of the frond, erect, bracts about 6, distichous, imbricate, spathe split down one side; stam. exceeding ov., fil. connate for $\frac{3}{4}$ length, staminodes shorter than ov.; capsule ovoid, 8-ribbed, ped. short, $\frac{1}{8}$ in.

On rocks in rivers and rapid streams, 1500 to 5000 ft.; rather rare. Palagala, above the waterfall at Ramboda (Gardner); Pundalu-oya (E. Green); Masnawatte River, Ambagamuwa; Mahaweli River below Peradeniya; Maskeliya River, Maskeliya. Fl. Jan.–March.

Also in the Nilgiris, S. India.

The fronds form a marchantia-like covering to the rocks, and seem to

have no definite form; if any l. are produced, they are very fugacious. This is the most montane of our species.

P. Gardneri, Harv. in Thw. Enum. 223 (C. P. 2989) grows with *P. olivaceum* at Ramboda and Pundalu-oya in Oct. and Nov. No flowers have been seen, the whole plant consisting merely of a stout simple cylindrical erect stem, $\frac{1}{4}$–$1\frac{1}{4}$ inch long, crowned with a tuft of very numerous filiform green 1-nerved leaves, red at the base. It is probably, as Thwaites suggests, an early stage of *P. olivaceum*, or perhaps an abnormal vondition. (*Dicræa apicata*, Tul., from the Nilgiris, seems to be nearly the same, and is considered to be a state of *P. dichotomus* of those mountains. It is well figured by Warming (l. c. vii. 4, ff. 18-25), who also shows a 'thallus' (with flowers), but allows that he has never been able to trace an actual connexion between this and the tufts, though the latter are always found alongside it.)

5. **P. metzgerioides,** *Trim.* n. sp. [PLATE LXXVI.]

Frond creeping, flat, ribbon-like, adpressed to surface of subjacent rock, about $\frac{1}{12}$ in. wide, rather zigzag, dichotomously branched, hard-fleshy, bright light green; l. few, $\frac{1}{4}$–$\frac{1}{2}$ in., linear-spathulate, obtuse, very delicate, in little tufts of 2–4 at edge of frond; fl. sessile, distant, bracts 3 or 4 thick, obtuse, spathe curved irregularly, lobed at mouth, enclosing ov.; stam. 1, fil. very long, 3 times length of ov., much exserted beyond spathe, thick, flat, anth. triangular, cells divergent at base, staminodes as long as ov. very slender; ov. nearly globose, styles linear, long, exserted, spreading; fruit not seen.

On rocks in rivers, at present found only at Hakinda on the Mahaweli below Peradeniya, where it was first collected in 1891 with the other species. Fl. Feb.

This should perhaps form a distinct genus, differing from *Podostemon* in its solitary stamen. If so, it may take the name *Mavælia* from the name, Mahawéli, of the river where it and all our species of the family are found. The Brazilian genera *Oserya* and *Devillea* are also monandrous, but quite unlike this in vegetative organs.

CVII.—NEPENTHACEÆ.

SEMI-SHRUBBY, climbing by prehensile petioles, l. alt., without stip., petiole dilated at end into large pitchers with the blade forming a hinged lid; fl. numerous, small, regular, diœcious, in large panicles; perianth with 4 deep segm.; stam. about 8, monadelphous, forming a central column, anth. extrorse; ov. superior, 4-celled, with numerous ovules on the septa, stigma sessile, large, lobed; fruit a capsule, splitting loculicidally into

4 valves; seeds very numerous, minute, testa produced into a long tail at each end, embryo axile in fleshy endosperm.

This Order contains only one genus confined to Tropics of Old World.

NEPENTHES,* *L.*

For characters, see Order.—Sp. 30; 9 in *Fl. B. Ind.*, but none in Peninsular India.

N. distillatoria, *L. Sp. Pl.* 955 (1753). **Bandura-wel,** *S.*
Herm. Mus. 16. Burm. Thes. 42. Fl. Zeyl. n. 321. *N. indica*, Poir. Enc. Meth. iv. 458. Moon Cat. 70. Thw. Enum. 290. Hk. f. in DC. Prod. xvii. 93. C. P. 262.
Fl. B. Ind. v. 68. Pluk. Phytog. t. 237, f. 3 (1696). Burm. Thes. t. 17. Gaertn. Fruct. ii. t. 83, f. 6 (fruit).

Stems stout, scarcely woody, climbing by prehensile petioles, quite glabrous; l. very large, chiefly consisting of the greatly modified petiole, lower portion of petiole dilated, leaf-like, about $6\frac{1}{2}$ in. by $1\frac{1}{2}$ in. wide, lanceolate, tapering to wide semi-amplexicaul base, glabrous except for a few fulvous hairs on margin, midrib very prominent beneath with 4 faint parallel longitudinal veins on either side connected by arched veinlets, middle portion of petiole about $4\frac{1}{2}$ in., cylindrical, slightly compressed, prehensile, pubescent with fulvous hair, terminal portion ('pitcher') $4\frac{1}{2}$ in., pendulous, curved upward so as to have the mouth horizontal, parallel-veined with transverse veinlets, cylindrical, flattened on one side between 2 narrow longitudinal ciliate wings or ridges, mouth not contracted, margin stiff, hard, incurved, sharply serrate, blade ('lid' of pitcher) $1\frac{1}{2}$–2 in., nearly orbicular, attached at back of mouth, at first horizontal closing the pitcher, afterwards erect, puberulous outside (beneath), thickly sprinkled with sunk red glands within (above), midrib obscure; fl. over $\frac{1}{2}$ in., on pubescent ped., panicle leaf-opposed (apparently terminal), 1 ft. or more long, narrow, lax, pubescent; perianth-segm. persistent, strongly pubescent outside, glabrous within; ov. silky-pubescent; capsule $\frac{3}{4}$ in., oblong, blunt, pilose.

Wet places, especially by the sides of water-courses in swampy places, in the moist low country mostly below 1000 ft.; common. Fl. March, September; dull orange-yellow.

Endemic.

The well-known 'Pitcher-plant' is abundant about Colombo, but much less so than formerly. Though usually found near sea-level, it

---

* Linnæus adopted this name from Breyne, who bestowed it in 1689 (Prodr. Pl. Rar. ii. 75), fancifully applying Homer's νηπενθής to the liquid found in these natural pitchers.

extends up to nearly the summit of Hiniduma Hill, *i.e.*, to nearly 2000 ft. This was the first species of *Nepenthes* made known to botanists. Grimm, a Swedish physician, who was in Ceylon in 1674, gives a full description in Ephem. Nat. Cur. an. 1, dec. 2, 363, with a figure. The interior of the pitcher is glabrous, and the lower portion is a darker green, shining, and very thickly set with minute, punctiform, dark-coloured glands, most numerous at the bottom. The stems are very tough, and are used as ropes.

CVIII.—ARISTOLOCHIACEÆ.

PERENNIAL herbs or shrubs, sometimes twining, l. alt., without stip., fl. moderate-sized, bisexual, regular or irregular, axillary; perianth 3-lobed or tubular and lipped; stam. 6 or 9, fil. connate in threes, or 0, the anth. being sessile round the style; ov. inferior, 4- or 6-celled, with numerous ovules; fruit capsular, dehiscent septicidally or loculicidally by 6 or 4 valves; seeds with minute embryo in copious fleshy endosperm.

Shrub; fl. regular, campanulate-rotate. . 1. BRAGANTIA.
Perennial herbs; fl. irregular, tubular . . 2. ARISTOLOCHIA.

1. **BRAGANTIA,*** *Lour.*

A shrub, l. alt., distichous, no stip.; fl. moderate-sized, in axillary cymes; perianth regular, deeply 3-lobed, segm. valvate; stam. usually 9, inserted on base of per., fil. usually connate in threes opp. the segm.; ov. inferior, 4-celled, with numerous ovules in two rows; capsule linear, quadrangular, dehiscing septifragally by 4 valves; seeds trigonous, strongly furrowed, embryo small, in copious fleshy endosperm.—Sp. 5; 4 in *Fl. B. Ind.*

B. Wallichii, *Br. in Wall. Cat.* n. 7415 (1828).
Trimeriza piperina, Lindl. Bot. Mag. sub t. 1543. Thw. Enum. 291. C. P. 2257.
Fl. B. Ind. v. 73. Wight, Ic. t. 520 (not good).

An erect slender shrub, 6–10 ft., bark smooth, yellowish, twigs swollen above nodes, young parts finely pubescent; l. distichous, 5–7 in., linear-lanceolate, acute at base, attenuate, very acute, entire, glabrous above, minutely pubescent and paler beneath, 3-nerved at base, veins prominent beneath,

---

* Commemorates John of Braganza, President of the Lisbon Academy in 1790.

petiole very short, stout; fl. on rather long pubescent ped., in shortly stalked irregularly umbellate cymes, bracts small, linear; per.-segm. over ¼ in., ovate, pubescent, concave; capsule 3–4 in., obtuse, 4-sided; seeds acute at both ends, deeply rugose.

Var. β, **latifolia,** *Duchart. in DC. Prod.* xv. 1, 430. C. P. 3457.

L. much broader, more pubescent beneath; capsule 6–8 in., strongly pubescent.

Var. γ, **brachycarpa,** *Hk. f. in Fl. B. Ind.* v. 73. C. P. 3533.

L. rather broader; capsule short, about 2½ in.

Damp shady forests in the moist region up to 4000 ft.; common. Fl. April, May; purple or greenish.

Also in Western India.

Leaves slightly aromatic when bruised.

2. ARISTOLOCHIA, *L.*

Perennial herbs, l. alt., fl. axillary; perianth irregular, tubular, inflated at base, extended on one side of mouth into a long lip with recurved margins, pilose within, stam. 6, fil. 0, anth. sessile in a circle round style; ov. inferior, long, 6-celled, with numerous ovules, style short, 6-lobed; capsule dehiscing septicidally through the placentas into 6 valves; seeds triangular.—Sp. 180; 8 in *Fl. B. Ind.*

Stems prostrate; l. deeply cordate at base; fl. solitary . . . . 1. A. BRACTEATA.
Stems twining; l. rounded at base; fl. in corymbs. . . . . 2. A. INDICA.

1. **A. bracteata,** *Retz. Obs. Bot.* v. 29 (1789). **Aḍutin-táppálai,** *T.*

Thw. Enum. 291. C. P. 2256.
Fl. B. Ind. v. 75.

Stems weak, prostrate, slender, branched, glabrous; l. 1–2 in., ovate-reniform, deeply cordate at base, rounded but often apiculate at apex, minutely crisped on margin, glabrous, glaucous beneath, petiole ½–¾ in.; fl. solitary, on longish ped.; perianth ½ in., inflated, base ovoid, lip oblong, obtuse, as long as tube; capsule 1½ in., oblong-ovoid, blunt, 12-ribbed, glabrous, seeds large.

Dry region, in sandy places; rather common. Jaffna; Mannar; Puttalam; Trincomalie; Batticaloa. Fl. January, September; dark purple.

Also Peninsular India, Arabia, Trop. Africa.

Leaves very bitter, and, as well as the root, much used as an anthelmintic and purgative.

2. **A. indica,** *L. Sp. Pl.* 960 (1753). **Sap-sanda,** *S.* **Peru-maruntu,** *T.*

Herm. Mus. 9. Burm. Thes. 32. Fl. Zeyl. n. 323. Moon Cat. 60. Thw. Enum. 291. C. P. 2258.

Fl. B. Ind. v. 75. Wight, Ic. t. 1858 (*A. lanceolata*).

Stems slightly woody at base, very long, slender, twining, glabrous; l. variable, usually about 4 in., linear-lanceolate, rounded at base, acuminate, obtuse, entire but somewhat undulate, glabrous, lower ones often ovate, subcordate at base, petiole $\frac{1}{2}$ in.; fl. on rather long glabrous ped., 2–4 in a shortly stalked corymb, bracts small, ovate, acuminate; perianth $1\frac{1}{4}$ in., inflated base globose, then bent at a right angle and suddenly narrowed into a cylindrical tube with trumpet-shaped mouth, lip oval, pilose; lobes of style short, pointed; capsule pendulous, globose-oblong with a slender base, the valves remaining attached to summit, seeds flat, winged.

Low country to 3000 ft.; common, especially in the moist region. Fl. November–January; greenish-white, lip blackish-purple.

Throughout India.

The leaves have a slightly aromatic scent and a faint bitter taste. The powdered root is a medicine of much repute in the treatment of children's bowel-complaints, and also forms an ingredient in a cure for cobra-bite.

[*A. Thwaitesii,* Hook., cultivated at Kew in 1856, and figured in Bot. Mag. t. 4918, was at first erroneously stated to be from Ceylon; its native country is not known.]

CIX.—PIPERACEÆ.

HERBS or shrubs often climbing, l. alt. or opp. (rarely whorled) with or without stip., fl. minute, bisexual or unisexual and usually diœcious, sessile, bracteate, in leaf-opposed or terminal spikes; perianth 0; stam. 1–3, anth.-cells distinct or confluent; ov. 1-celled with a solitary erect ovule, styles 2–6; fruit indehiscent, pulpy or dry; seed solitary, with a very minute embryo in copious hard floury endosperm.

Usually climbing; fruit not minute . . 1. PIPER.
Not climbing; fruit minute . . . 2. PEPEROMIA.

Principally found in the moist region, especially in the hills where 9 out of our 14 species occur, 5 of them (3 *Piper* and 2 *Peperomia*) being endemic.

1. PIPER, *L.*

Perennial herbs or shrubs usually scandent by adventitious roots at the nodes, l. alt., entire, stip. membranous, enclosing

bud, fl. minute, usually unisexual and diœcious (rarely bisexual or monœcious), each sessile in axil of a fleshy bract and often with 2 lateral bractlets, arranged in leaf-opposed or terminal spikes; perianth 0; stam. 1–3, anth. 2-celled; styles 2–6; fruit more or less globose, slightly pulpy; seed solitary, with hard endosperm.—Sp. 520 (described); 45 in *Fl. B. Ind.*

Spikes solitary.
  Fruit very small, sunk in fleshy cylindrical axis (*Chavica*).
    Fruit-spike under 2 in., erect . . . 1. P. LONGUM.
    Fruit-spike over 2 in., pendulous . . . 2. P. BETLE.
  Fruit distinct, sessile on axis.
    Bracts circular, peltate, margin free all round . . . . 3. P. THWAITESII.
    Bracts oblong or oval, adnate to axis except at summit.
      Bracts without or with very slightly raised margins; fruit $\frac{1}{4}$ in.
        L. over 4 in., broadly ovate-oval; fl. usually bisexual . . . . 4. P. NIGRUM.
        L. under 4 in.
          L. $1\frac{1}{2}$–$2\frac{1}{2}$ in., broadly ovate-oval, reticulate . . . . . . 5. P. ZEYLANICUM.
          L. 2–4 in., oblong-lanceolate, 3-veined . . . . . . 6. P. TRINEURON.
      Bracts with raised margins; fruit $\frac{1}{8}$ in.
          Fruit broadly ovoid . . . 7. P. ARGYROPHYLLUM.
          Fruit globose . . . . . . 8. P. SYLVESTRE.
Spikes in umbels (*Heckeria*) . . . . 9. P. SUBPELTATUM.

1. **P. longum,** *L. Sp. Pl.* 29 (1753). **Tippili,** *S. & T.*

Fl. Zeyl. n. 30. Moon Cat. 5. *Chavica Roxburghii*, Miq., Thw. Enum. 292. C. P. 2953.

Fl. B. Ind. v. 83. Wight, Ic. t. 1928. Bentl. and Trim. Med. Pl. t. 244

Rootstock erect, thick, jointed, branched, stems numerous, 2–3 ft., ascending or prostrate (not climbing) much branched, stout, cylindrical, thickened above nodes, finely pubescent; l. numerous, $2\frac{1}{2}$–$3\frac{1}{2}$ in., lower ones broadly ovate very cordate with broad rounded lobes at base, upper ones oblong-oval, cordate at base, all subacute, entire, glabrous, thin, bullate with reticulate venation sunk above and raised beneath, dark green and shining above, pale and dull beneath, petiole of lower l. 2–3 in., stout, of upper l. very short or none, stip. about $\frac{1}{2}$ in., membranous, lanceolate, obtuse, soon falling; spikes solitary pedunculate, male slender, bracts narrow, fem. $\frac{1}{2}$–1 in., bracts circular, flat, peltate; stam. 2; stigmas 3 or 4, short, spreading, persistent; fruit very small, ovoid, completely sunk in solid

fleshy spike which is 1–1½ in., ovoid-oblong, erect, blunt, blackish-green, shining.

Low country, principally in the dry region. I have only seen it in native gardens in cultivation. Fl. all the year.

Throughout India and Malaya, wild or cult.

I doubt if this be a wild plant anywhere in Ceylon. The fruiting spike when dried forms the 'Long Pepper' of commerce. There is a specimen in Hermann's Herb. Male plants seem to be very scarce; I have never seen one.

2. ***P. Betle,*** * *L. Sp. Pl.* 28 (1753). **Bulat, Bulat-wel,** *S.* **Vettilai,** *T.*

Herm. Mus. 34, 36. Burm. Thes. 46. Fl. Zeyl. n. 27. Moon Cat. 5. *Chavica Betle*, Miq., Thw. Enum. 292. C. P. 3692.

Fl. B. Ind. v. 85. Burm. Thes. t. 83, f. 2. Wight, Ic. t. 1926 (not good). Rheede, Hort. Mal. vii. t. 15.

Stems semi-woody, climbing by many short adventitious rootlets, very stout, much thickened at nodes, young parts glabrous; l. large, 6–8 in., broadly ovate, slightly cordate and often a little unequal at base, shortly acuminate, acute, entire but margin often rather undulate, usually 7-nerved, glabrous, thick, bright green and shining on both sides, petiole ¾–1 in., stout; spikes dense cylindrical, female 1–2 in., pendulous, bracts triangular-rotundate, peltate, yellow, rachis pilose; stigmas 5 or 6, spreading stellately; fruit sparingly produced, quite immersed in the fleshy spike (and forming nodosities there) which is about 2 in. long and pendulous.

Var. β, **Siriboa,** *Trim.*, Cat. Ceyl. Pl. 74. **Rata-bulat-wel, Siribo,** *S. P. Siriboa*, L. Sp. Pl. 29. Fl. Zeyl. n. 29. Moon Cat. 4. *Chavica Siriboa*, Miq., Thw. Enum. 292. C. P. 3690.

Leaves duller green and scarcely shining above, whitish beneath, when young, with scattered short hairs on both surfaces, petioles finely pubescent; fruit-spikes much longer (6 or 7 in.), tapering at end, pendulous, irregularly nodose with more numerous fruits.

Low country, very commonly cultivated in native gardens, but not wild.

The Betel leaf, cultivated generally in the Tropics; no doubt originally an Eastern plant, but its native country not known. Var. β is considered to have been introduced here from the Malay Archipelago, and is called the Foreign Betel. Besides this *Rata-bulat-wel*, there are many varieties recognised by cultivators; Moon gives seven.

P. Malamiris, L., is based on Hermann's specimens (Fl. Zeyl. n. 28),

---

* Betle and Betre are the Malabar names as given by Clusius and Acosta, and other writers of the sixteenth century; doubtless allied to the Tamil name.

which are probably a 5-nerved variety of Betel (see Journ. Linn. Soc. xxiv. 134), but the Sinhalese name 'Malamiris' refers to a wild species (*P. sylvestre*).

P. Chawya, Ham. (*Chavica Chuvya*, Miq., Thw. Enum. 428), is another variety scarcely distinguishable from var. *Siriboa*. It is called 'Siwiya-wel,' and is C. P. 3691. The leaves are usually very unequal at the base, thick, dark green, and shining above. Figured in Miq. Ill. Pip. t. 39.

Betel leaves are a universal masticatory, and considered to be stimulant and carminative; the whole plant has a peculiar and characteristic odour and taste. I have not seen male flowers, and fruit is rare, the plant being always propagated by cuttings.

3. **P. Thwaitesii,** *Cas. DC. in DC. Prod.* xvi. 1, 357 (1869). [PLATE LXXVII.]

P. arcuatum, Thw. Enum. 293 (in part). *P. bantamense*, Cas. DC. l. c. 362. Trim. Sys. Cat. Ceyl. 74. C. P. 2178 (35 part).

Fl. B. Ind. v. 82. (*P. caninum*, var.)

Widely climbing, stems attaining ¾ in. diam., much branched, greatly thickened at nodes, bark rough, lenticellate, young parts glabrous; l. 3–4 in., ovate-lanceolate, rounded or slightly tapering and often unequal at base, acuminate, very acute, prominently 5-nerved from near the base, with the cross-veins conspicuous beneath, glabrous, coriaceous, slightly bullate above, paler almost glaucous beneath, petiole ½–¾ in.; spikes slender, drooping, peduncle shorter than petiole, male 1–2 in., female under 1 in. (occasionally monœcious with male fl. in upper and fem. in lower portion), rachis finely hairy, bracts densely crowded, at first slightly imbricate, peltate, circular, margins membranous, free all round, sometimes denticulate; stam. 2 (rarely 1), fil. very thick and short, anth.-cells distinct; stigmas usually 4 (sometimes 2 or 3); fruiting spikes 1–2 in., rachis much twisted and flexuose, thick, fruit few, irregularly produced (the intermediate spaces occupied with numerous undeveloped or abortive ovaries), about ¼ in., broadly ovoid or nearly globose, not at all narrowed at base, dull red, pulp rather copious.

On trunks of trees in upper montane zone; common. Fl. May–Sept. Endemic (?).

Each fruit, both mature and abortive, appears to be surrounded at its base by a membranous cup. This is, however, made up of the free margins of the four surrounding bracts and by fluffy brownish hairs coming off from the rachis between them.

I do not understand for what reason Sir J. Hooker (in Fl. B. Ind.) places this in the *Cubeba* section and under *P. caninum*, Bl. It seems to belong to his section *Pseudo-Chavica*, and has some points of resemblance with *P. Schmidtii*, Hk. f. of the Nilgiris; the fruit is never at all stalked. Dries black. There is a variety with much smaller fruit. Fruit pungent to taste, and collected by the natives for a condiment.

4. **P. nigrum,** *L. Sp. Pl.* 28 (1753). **Miris, Gam-miris-wel,** *S.* **Milaku,** *T.*

Herm. Mus. 32. Burm. Thes. 193. Fl. Zeyl. n. 26. Moon Cat. 4. Thw. Enum. 292. C. P. 2176.

Fl. B. Ind. v. 90. Wight, Ic. t. 1934 and (*P. trioicum*) t. 1935. Rheede, Hort. Mal. vii. t. 12. Miquel, Ill. Pip. t. 50.

Stems climbing, rooting sparingly, cylindrical, much thickened at nodes, glabrous, shining; l. 5–7 in., ovate-oval, usually broad, rounded or slightly acute at sometimes unequal-sided base, acuminate, acute, generally 7-veined (the two outer ones often faint), coriaceous, glabrous, paler beneath, petiole 1–1½ in., stout; fl. usually bisexual, spikes 2–3 in., slender, bracts oblong, upper part free, concave, very obtuse; stam. 2; styles 2–4; fruiting spike 4–6 in., pendulous, slightly interupted; fruit not exceeding ¼ in., nearly globose, not apiculate, at first dark-green, passing through orange yellow to dull red when ripe, bractlets connate above, forming the upper margin of a shallow nearly circular cup round the fruit, pulp scanty, seed ovoid-globose, pointed at base, testa thin, hard, smooth, yellow.

Moist low country, cultivated in gardens but very doubtfully native. Thwaites gives Ambagamuwa as a wild locality. Fl. Sept., Jan., &c.

Said to be wild in the forests of the Circars, Peninsular India, and perhaps in Malabar, and cultivated in the Tropics generally. This affords ordinary 'black pepper' of commerce. Several varieties are cultivated, distinguished by the size and flavour of the fruits, and the colour and texture of the leaves. The fruit is scarlet when ripe; but inferior varieties remain for a long while yellow, or never become red, and have a bitter flavour mixed with the pure pungency; one of these, with larger leaves paler beneath and more coriaceous, is called 'Bakamuna-miris' by the Sinhalese, and may be a wild plant here. Miquel's figure quoted above represents a plant (from Burmann's Herbarium) collected in Ceylon in 1773. It has broad 7-nerved leaves and bisexual flowers.

5. **P. zeylanicum,** *Miq. in Lond. Journ. Bot.* iv. 436 (1845).

P. arcuatum, Thw. Enum. 293 (part); Cas. DC. l. c. 360 (non Bl.) and 366. Trim. Syst. Cat. Ceyl. 74. C. P. 2177.

Fl. B. Ind. v. 91.

Stems much thickened at nodes, cylindrical, glabrous; l. small, 1½–2½ in., ovate or ovate-lanceolate, rounded at base, acuminate, obtuse, glabrous, thick and rigid 5- (or 3-) nerved from base, venation prominent beneath, usually depressed above, petiole ¼–½ in.; male spikes about 1 in., very slender, fem. ones shorter and stouter, bracts rounded, imbricate; stam. 2, styles 2–4 (usually 3), fruiting spike short, ¾–1¼, tortuous, fruits numerous, often crowded, about ¼ in., broadly ovoid.

Climbing on trees in montane zone above 4000 ft.; rather common. Fl. April, May.

Endemic.

Readily known by its small thick leaves very prominently veined beneath. Originally described from Walker's specimens (No. 31).

6. **P. trineuron,** *Miq. in Lond. Journ. Bot.* v. 555 (1846).

Thw. Enum. 293. *P. insulare*, Cas. DC. l. c. 262, and *P. ceylanicum*, Cas. DC. l. c. 242 (non Miq.). C. P. 2175.

Fl. B. Ind. v. 91.

Stems long, slender, very much thickened at nodes, glabrous; l. 2–4 in., narrowly oblong-lanceolate, tapering to both ends, somewhat acuminate, obtuse, glabrous, 3- (rarely 5-) nerved from the base, with several other very oblique lat. veins from midrib, petiole ¼ in., slender, male spikes not seen, '2–3 in., stam. 2,' fem. spikes 2–3 in. very slender, erect, fl. rather distant, rachis glabrous, styles 3; fruit over ¼ in., rather distant, globose.

Var. β, **laxiflorum,** *Trim. Syst. Cat. Ceyl.* 74. *Muldera diandra*, Thw. Enum. 428. C. P. 3738.

L. larger, 5–7 in., lanceolate; fl. more distant.

Forests of moist region, in lower montane zone; rather rare. Ambagamuwa; Hantane; Hunasgiriya. Var. β, in moist low country. Pasdun Korale; Singhe Raja Forest; Mapalagama, S. Prov. Fl. March.

Endemic.

First described from Walker's collections (No. 1784). Distinguished by its narrow leaves. Var. β is scarcely worth distinction, but was referred to a different genus by Thwaites.

7. **P. argyrophyllum,** *Miq. Syst. Pip.* 330 (1843). **Walgammiris-wel,** *S.*

Thw. Enum. 293. Cas. DC. in DC. Prod. xvi. 1, 364. C. P. 2625.

Fl. B. Ind. v. 93. Wight, Ic. t. 1941. Miq. Ill. Pip. t. 56.

Stems woody, attaining 2½ in. in diam., with grey slightly rough bark, cylindrical or oval, much thickened or globose at nodes, with many rootlets; l. 4–7 in., ovate or ovate-lanceolate, rounded and nearly equal-sided at base, suddenly acuminate, acute, quite glabrous, 5-veined from base with usually 2 more veins from midrib, coriaceous, shining, paler or whitish beneath, petiole ½–1 in., stout; fl. diœcious; male spikelets very slender, 4–6 in., bracts large oval, with raised margins; fem. spikes slender, bracts decurrent, rachis glabrous, fl. numerous; stam. 2; stigmas 4 (or 3); fruiting spike 4–7 in., pendulous, fruit crowded, small, ⅛ in. or rather more, broadly ovoid (slightly tapering at top when dry), minutely apiculate, dark green, bracts with raised margins, free part short fleshy, cup round fruit very shallow, oval, bractlets with a ring of hair within.

Var. β, **Walkeri,** *Trim.* *P. Walkeri*, Miq. in Lond. Journ. Bot. iv. 439. *P. arborescens*, Thw. Enum. 293 (part), non Roxb. C. P. 35 (part), 2461.

Leaves smaller, broader, thinner, often 7-veined, with the veins more prominent, less white beneath.

Moist country, 1000–4000 ft.; common. Fl. January, October.

Also in Southern India.

This is the commonest wild pepper in Ceylon, covering the trunks of the trees like ivy, and is very abundant as a wild plant in the Botanic Gardens, Peradeniya. It is distinguished from *P. nigrum* by being always diœcious, by the different bractlets, and the smaller fruit, which I believe never becomes red; but they are difficult to distinguish. The Fl. B. Ind. gives six varieties, but in Ceylon it is not a variable species. I doubt, however, if it be really distinct from *P. sylvestre.*

A plant with the stems, petioles, and under surface of the leaves densely pubescent is probably *P. Hymenophyllum*, Miq.; but my specimens, collected at Madulkelle, are too imperfect to decide with certainty. *P. diffusum*, Vahl, Enum. Pl. i. 333, collected in Ceylon by Kœnig, is probably referable to this species. The flavour of the fruit is weak and slightly bitter, not purely pungent.

8. **P. sylvestre,** *Lam. Ill. Gen.* i. 79 (1791). **Wal-gammiris-wel, Mala-miris-wel,** *S.*

Moon Cat. 4. Thw. Enum. 293. C. P. 3688.

Fl. B. Ind. v. 93. Wight, Ic. t. 1937.

Stems cylindrical, glabrous, rather slender; l. 3–5 in., rather narrowly ovate-oval, acute or slightly rounded at base, acuminate, acute, sometimes slightly pubescent beneath, 5-veined, paler beneath, petiole about $\frac{1}{2}$ in.; fl. diœcious, male spikes about 4 in., very slender, stam. usually 3; styles 3 or 4; fruiting spike 4–6 in., fruit rather crowded, small, about $\frac{1}{8}$ in., globose, rachis glabrous, bracts with raised margins, the cup round the fruit oval, rather deep.

Low country, both in moist and dry region up to 3000 ft.; apparently rather common. Ramboda; Dolosbagie; Ekiriankumbura, Uva; Trincomalie. Fl. January, February.

Also in Peninsular India, Assam, and the Mascarene Islands.

I do not know how to distinguish this from the last, *P. argyrophyllum*, and believe them to be one species; if really Lamarck's *P. sylvestre*, that name must be kept. I have thought it best to merely describe C. P. 3688, which is referred definitely to this species by all the monographers.

9. **P. subpeltatum,** *Willd. Sp. Pl.* i. 166 (1797). **Mala-labu,** *S.*

Moon Cat. 5. *Pothomorphe subpeltata*, Miq., Thw. Enum. 292. C. P. 2714.

Fl. B. Ind. v. 95. Wight, Ic. t. 1925.

A large perennial erect herb, stem 3–5 ft., very stout, jointed, glabrous but warted, slightly zigzag, thickened at nodes, branched; l. very large, 8–12 in., orbicular, very deeply cordate at base, very shortly acuminate, entire or nearly so,

nearly glabrous except on veins which are palmate pellucid and prominent beneath, thin, somewhat bullate above, whitish beneath, petiole 4–8 in., cylindrical in upper, channelled in lower part, amplexicaul, pubescent; spikes $2\frac{1}{2}$–5 in., erect, very shortly stalked, linear, blunt, 2–5 together in stalked axillary umbels usually in pairs; fl. bisexual, minute, extremely numerous, densely packed, bracts very small, stalked, succulent, with a thickened triangular glabrous top; stam. 2; stigmas 3; fruit extremely small, obovate-ovoid, trigonous, flat-topped, brown.

Moist region in shady places to 4000 ft.; rather common. Fl. December.

Also in India, Malaya, Trop. Africa, and Madagascar.

Whole plant pleasantly aromatic, slightly pungent.

2. **PEPEROMIA,** *Ruiz. & Pav.*

Herbaceous, annual or perennial, not climbing, succulent, l. alt., opp. or whorled, entire, without stip., fl. minute, bisexual, in sessile or terminal or leaf-opposed spikes, each with a fleshy peltate bract; perianth 0; stam. 2, fil. very short, anth.-cells confluent; styles 2 or more, very short; fruit minute, indehiscent, dry.—Sp. 370 (described); 10 in *Fl. B. Ind.*

L. alternate (see also 2) . . . 1. P. PSEUDO-RHOMBEA.
L. opposite.
  L. glabrous, rotundate . . . 2. P. WIGHTIANA.
  L. glabrous, oblong-oval. . . 3. P. CONFUSA.
  L. pubescent . . . . . 4. P. DINDIGULENSIS.
L. in whorls of 4. . . . . 5. P. REFLEXA.

1. **P. pseudo-rhombea,** *Cas. DC. in DC. Prod.* xvi. 1, 440 (1869). *P. courtallensis*, var. β, Thw. Enum. 292. Trim. Syst. Cat. Ceyl. 74. C. P. 2172.

Fl. B. Ind. v. 97.

Stem usually procumbent and rooting at lower nodes, with suckers, then erect, about 1 ft. high, glabrous, succulent; l. $1\frac{1}{2}$–3 in., alt., oblong-lanceolate or oval, tapering or rounded at base, acute, obscurely 3-nerved, thick, glabrous, petiole $\frac{1}{4}$–$\frac{3}{4}$ in., spikes stalked, very slender, lengthening out to 3–4 in., fl. distant; fruit globose, warted.

Var. β, **tenuis,** *Trim.*

Leaves thinner in texture, with 5 veins, the 3 principal ones broad and conspicuous, and 2 lat. ones fainter.

On wet rocks in the lower montane zone, 3000–5000 ft.; rather rare. Hantane; Hewahette. Var. β, on Ritigala Hill, N.C. Province, at about 2000 ft. Fl. July–October.

Endemic.

Var. β is, perhaps, *P. Thomsoni*, Hk. f., given doubtfully for Ceylon in Fl. B. Ind., and found in the Nilgiri Mountains.

P. Fraseri, Cas. DC.—A little annual species, which appears to be this, is a very common weed in Peradeniya Gardens. It is a native of Trop. America.

2. **P. Wightiana,** *Miq. in Lond. Journ. Bot.* v. 548 (1846).

P. Heyneana, Miq., Thw. Enum. 292 (part). *P. zeylanica*, Miq. l. c. 550. Trim. Syst. Cat. Ceyl. 74. C. P. 3954.

Fl. B. Ind. v. 98.

Stems 3–6 in., procumbent or ascending, slender, glabrous or nearly so, l. ½–1 in., alt. or opp., rotundate-oval, rounded at both ends, slightly ciliate, otherwise glabrous, obscurely veined, petiole ¼–½ in., slender; spikes 1–1½ in., stalked, very slender, much exceeding l., erect; fl. laxly arranged; fruit globose, slightly rough.

Upper montane zone; very rare (?) Bopatalawa, at about 6000 ft. Fl. October.

Also in S. India.

I have seen only the C. P. specimens.

3. **P. confusa,** *Hk. f. in Fl. B. Ind.* v. 98 (1886).

P. courtallensis, Thw. Enum. 292; Cas. DC. l. c. 463. Trim. Syst. Cat. Ceyl. 74 (non Miq.). C. P. 2173.

Fl. B. Ind. v. 98.

Stem 3–9 in., ascending, with many roots at the lower nodes, then erect, much branched, succulent, glabrous; l. opp. rarely in whorls of 3, variable, ¼–1½ in., oval or oblong-oval, tapering to base, obtuse at apex, entire or slightly crenate, fleshy, faintly 3-nerved, petiole short; spikes numerous, long-stalked, much exceeding l., erect, rather stout, blunt, often thickened upwards, fl. closely placed.

On rocks and trees in the lower montane zone, 3000–5000 ft.; rather common. Fl. September–January. First collected in Hantane by Moon.

Endemic.

Very variable in habit, size of leaves, &c.; a very dwarf, succulent state is not uncommon. I follow Sir J. Hooker in separating this from the widely distributed *P. portulacoides*, A. Dietr. (*P. courtallensis*, Miq.), which, however, chiefly differs in its longer petioled leaves; it is figured in Wight, Ic. t. 1922, f. 2.

4. **P. dindigulensis,** *Miq. Syst. Pip.* 122 (1843).

P. Heyneana, Thw. Enum. 392 (part) (non Miq.). *P. Thwaitesii*, Cas. DC. l. c. 448; Trim. Syst. Cat. Ceyl. 74. C. P. 2956.

Fl. B. Ind. v. 98 (not given for Ceylon). Wight, Ic. t. 1922, f. 1 (*P. Heyneana*) and t. 1924 (*P. Wightiana*).

Whole plant (except spikes) covered with fine close pubescence, stems erect, stout, succulent, rooting at lower

nodes; l. opp., variable, $\frac{3}{4}$–$2\frac{1}{2}$ in.; oval or rhomboid-oval or nearly rotundate, tapering at base, often slightly acuminate, usually obtuse, finely pubescent on both sides, rather thick, pale beneath, with 3 broad very prominent nerves, petiole $\frac{1}{4}$–$\frac{3}{4}$ in.; spikes 2–4 in., very slender, shortly stalked, glabrous, fl. scattered, rather distant; fruit viscous with sessile glands.

Var. β, **hirsuta,** *Trim.*

Smaller, l. $\frac{1}{2}$–$\frac{3}{4}$ in., very hairy, spikes shorter.

On wet rocks and trees in low country up to 3000 ft.; rather common. Hantane; Lunugala; Hiniduma. Var. β, in upper montane zone. Oya; Horton Plains. Fl. November–January.

Also in S. India.

Easily known by its dense covering of fine tomentose hairs. I have never seen alt. leaves in Ceylon.

5. **P. reflexa,** *A. Dietr. Sp. Pl.* i. 180 (1839).
Thw. Enum. 292. C. P. 2462.
Fl. B. Ind. v. 99. Wight, Ic. t. 1923, f. 1.

Stems creeping, rooting at nodes, much fasciculately branched, branches erect, quadrangular, pubescent; l. usually 4 in a whorl (rarely opp. or 3), small, $\frac{1}{4}$–$\frac{1}{3}$ in., on very short petioles, oval or rhomboid-oval or nearly rotundate, obtuse, pubescent, stiff and fleshy, gland-dotted, veins invisible; spikes solitary, terminal $\frac{3}{4}$–1 in., long-stalked, rather stout, rachis hairy; fruit ovoid, pubescent on top.

On rocks and trees in the montane zone, 3000–6000 ft.; common. Fl. October–January.

In India, Malaya, China, Australia, Africa, America.

Cas. DC. gives 13 varieties of this very widely distributed little plant, the Ceylon form coming under var. *parvifolia.*

CX.—CHLORANTHACEÆ.

Shrubs, l. opp., serrate, fl. small, unisexual (but apparently bisexual), in axillary and terminal spikes; perianth 0; stam. 1, large, fil. fleshy, anth. 2-celled; ov. 1-celled, with a single ovule pendulous from top, stigma sessile; fruit fleshy, indehiscent; seed solitary, pendulous, embryo minute in copious fleshy endosperm.

CHLORANTHUS, *Swartz.*

For characters, see Order.—Sp. 8; 2 in *Fl. B. Ind.*

C. brachystachys, *Bl. Fl. Jav.* f. viii. 13 (1829).
Sarcandra chloranthoides, Gardn. in Calc. Journ. Nat. Hist. vi. 348. *C. ceylanicus*, Miq. Fl. Ind. Bat. i. 802. Thw. Enum. 293. Solms in DC. Prod. xvi. 1, 475. C. P. 2207.
Fl. B. Ind. v. 100. Wight, Ic. t. 1946 (*Sarcandra chloranthoides*). Bl. Fl. Jav. l. c. t. 2.

A small bush about 4 ft., stems cylindrical, glabrous, dark green, rather large, 5–7 in., lanceolate, tapering at both ends, very acute, coarsely spinous-serrate, glabrous and shining, petioles $\frac{1}{4}$–$\frac{1}{2}$ in., connate and forming a short stipular sheath; fl. sessile, in connate pairs of a male and fem. (looking like a single fl.) in short lax spikes forming a terminal paniculate inflor., bracts small; stam. large and conspicuous, fusiform, pointed; ov. glabrous; fruit $\frac{1}{3}$ in., broadly ovoid, apiculate, purplish-black.

Forests of the moist region, 2000–5000 ft.; rather common. Fl. Feb.–June; stam. pinkish-yellow.
Khasia, Travancore, Penang, Java, China, Philippine Is., Japan.

CXI.—MYRISTICACEÆ.

Trees, l. alt., spreading distichously, without stip., entire, fl. unisexual, diœcious, regular; perianth 3- or 2-lobed lobes valvate; stam. 6–14, wholly or fil. only connate to form a central column, anth. 2-celled; ov. superior, 1-celled, with a single basal erect ovule, style very short; fruit fleshy or leathery but dehiscent into 2 valves; seed very large, enclosed in an entire or lacerate coloured aril, embryo small at base of abundant much ruminated endosperm.

An Order consisting of a single genus, all Tropical.
Trees of the moist and intermediate regions, *M. laurifolia* ascending into the lower hills.

MYRISTICA, *L.*

For characters, see Order.—Sp. 68 (King); 30 in *Fl. B. Ind.*

Male fl. few, moderate-sized, in close racemes or clusters.
Fruit ovate-ovoid, blunt . . . . . . 1. M. laurifolia.
Fruit oblong, acute . . . . 2. M. zeylanica.
Male fl. numerous, very small, in large panicles.
Male fl. sessile; fruit 2 in. . . . . . 3. M. Horsfieldia.
Male fl. on ped.; fruit 1 in. . . . . . 4. M. Irya.

1. **M. laurifolia,** *Hk. f. and Th. Fl. Ind.* 163 (1855). **Mala-boda,** *S.* **Palmanikam,** *T.*

Burm. Thes. 172. *M. tomentosa*, Moon Cat. 70 (non Willd.). *M. diospyrifolia*, A. DC. in Ann. Sc. Nat. ser. 4, iv. 29. Thw. Enum. 11. King in Ann. B. G. Calc. iii. 290. C. P. 416.

Fl. B. Ind. v. 103. Bedd. Fl. Sylv. t. 267. Ann. Bot. Gard. Calc. iii. t. 112.

A large tree, with spreading branches, bark orange-grey, rather smooth, young parts fulvous-puberulous; l. large, 5–9 in., oval or lanceolate-oval, slightly rounded at base, entire, quite glabrous, coriaceous, lat. veins numerous, parallel, translucent, petiole 1–1½ in., very stout, channelled above; fl. on short stout ped., in nearly sessile clusters in axils of fallen l., the male more numerous, very shortly racemose, bract close beneath fl. and shorter than it, oval, obtuse, rufous-pubescent; perianth ovoid or urceolate, ¼ in., rufous-pubescent, segm. 3, short, acute, recurved; anth. 10–14; ov. pubescent; fruit on a short stout stalk, ovate-ovoid, about 2 in., blunt, densely covered with a fine scurfy rusty-orange pubescence, pericarp very thick and fleshy; seed nearly 1½ in., testa thin, brittle, chocolate-brown, shining, endosperm cheesy, moderately ruminate, aril much and deeply cut with lacerate linear segm. as long as or longer than seed.

Forests in the moist region, 1000–5000 ft., common, occasionally in the dry region. Fl. October, June; orange-yellow.

Also in S. India.

Previously to 1855 this familiar tree was confounded with *M. malabarica*, Lam., of S. India. *M. dactyloides*, Gaertn. Fruct. 194, however, seems to be *M. laurifolia;* his figure, t. 41, f. 2, agrees so far as it goes, and he quotes Fl. Zeyl. n. 588, which is, no doubt, this tree, but was not named by Linnæus, as there was no specimen in Hermann's Herbarium.

The petioles enclose the leaf-buds acting like stipules or bud-scales. In old trees the stem and large branches emit short tufts of stout woody aërial roots. The bark and leaves boiled are used as a gargle in throat affections. An orange-red astringent gum exudes from the bark.

The wood is light, soft, and pale yellow; it is sometimes used for tea-boxes.

2. **M. zeylanica,** *A. DC. in Ann. Sc. Nat.* ser. 4, iv. 29 (1855).

Thw. Enum. 11, 399. *M. laurifolia*, var. *zeylanica*, Trim. Syst. Cat. Ceyl. 74. King, l. c. 289. C. P. 2923.

Fl. B. Ind. v. 103 (*M. laurifolia*, var.). Ann. Bot. Gard. Calc. iii. t. 111.

A tall tree, bark reddish-grey, young parts slightly puberulous; l. 5–9 in., lanceolate or oblong-lanceolate, acute at base, obtuse or subacute at apex, glabrous and shining, coriaceous; fl. as in *M. laurifolia*, but ped. more slender and male fl. more numerous; fruit about 2 in. narrowly ovate-or oval-oblong, pointed, the point often slightly curved, pericarp rather thin, leathery; rest as in the last.

Forests in the intermediate zone, rare. Medamahanuwara; Uma-oya; Naula near Nalande (Alexander). Fl. April.

Endemic.

Considered a variety of *M. laurifolia* in Fl. B. Ind., but King keeps it as distinct.

3. **M. Horsfieldia,** *Bl. Bijd.* 577 (1825). **Ruk,** *S.*

Burm. Thes. 173. *Horsfieldia odorata*, Willd., Moon Cat. 70. *M. Iryaghedhi*, Gaertn. Fruct. i. 196. Thw. Enum. 11. King, l. c. 296. C. P. 221.

Fl. B. Ind. v. 106. Wight, Ic. t. 1857 (*Pyrrhosia Horsfieldii*). Gaertn. l. c. t. 41, f. 4 (fruit). Ann. Bot. Gard. Calc. iii. tt. 122–3.

A large tree, with tall straight trunk and numerous long drooping branches, bark thin, brownish-grey, slightly cracked, branchlets marked with l.-scars, young parts orange-tomentose; l. large, 7–12 in., oblong-lanceolate, acute or slightly rounded at base, acuminate, acute or obtuse, entire, glabrous bright green and polished above, glaucous and with more or less orange stellate tomentum (easily rubbed off) beneath, petiole 1 in., very stout, rufous-tomentose; male fl. very numerous, very small, sessile, in many dense globose heads sessile on branches of large spreading orange-tomentose panicles 4–6 in. long from the axils of fallen l., fem. fl. fewer, much larger, in short axillary panicles; perianth thick, segm. 3, deep; stam. 6; ov. densely tomentose; fruit about 2 in., broadly ovoid or nearly globose, rufous-tomentose, pericarp thick; seed about 1½ in., oblong-ovoid, aril scarcely lobed, completely covering the seed, dead orange-chrome coloured, testa thin, endosperm much ruminated.

Moist low country, up to 1000 ft.; common. Fl. August–October, also Feb., March; orange-yellow.

Endemic?

Gaertner's name has priority, but it is a barbarous one taken from Hermann (Mus. 58) and is not the correct Sinhalese name of the tree. The male flowers are extremely fragrant, with precisely the scent of sandal-wood; a scent is made from them. Burmann's figure (Thes. t. 79) is very bad, and Wight's (from a drawing by Mrs. Walker) has the leaves much narrower than usual. Wood moderately heavy, even-grained, yellowish; used for boats in the Southern Prov.

4. **M. Irya,** Gaertn. Fruct. i. 195 (1788). **Iriya,** *S.*

Burm. Thes. 172. Moon Cat. 70. Thw. Enum. 11. King, l. c. 308. C. P. 2620.

Fl. B. Ind. v. 109. Gaertn. l. c. t. 41, f. 3. Ann. Bot. Gard. Calc. iii. t. 141.

A rather slender erect tree about 40 ft., branched at the top, bark purplish-grey, smooth, marked with l.-scars, young parts slightly rusty-furfuraceous; l. numerous, 7–12 in., oblong- or linear-lanceolate, acute at base, acuminate, acute, glabrous,

not coriaceous, curved, shining above, slightly paler beneath, petiole very short, flat on top, male fl. minute, very numerous, on short ped., clustered, in much-branched rusty-pubescent, thyrsoid panicles 3–4 in. long from the axils of fallen l., with numerous small linear-lanceolate bracts, fem. fl. larger, much fewer, in short close panicles, perianth globose, segm. 2; stam. 6–10, fil. combined into a turbinate column, anth. distinct; fruit globose, nearly 1 in., pericarp leathery, rusty-tomentose outside, glabrous and bright pink within; seed globose, completely covered by the entire scarlet aril.

Moist low country up to 2000 ft., rather common. Fl. Jan.–Feb.; pale yellow.

Also in Burma, Malacca, Andaman and Malay Is.; not in Peninsular India.

The *M. salicifolia* of Moon Cat. is probably a narrow-leaved variety.

Wood much as in *M. Horsfieldia.*

CXII.—MONIMIACEÆ.

SHRUBS, l. opp., entire, without stip., fl. bisexual, regular; perianth of many leaves in several rows, outer sepaloid, inner petaloid, much imbricated; stam. 5–9, hypogynous in 2 rows, fil. short with 2 large lateral appendages, anth. 2-celled; carp. superior, about 9, distinct, each with a solitary pendulous ovule, style short; fruit a cluster of distinct fleshy carp. on a receptacle, surrounded by persistent perianth-leaves, indehiscent; seed solitary, flattened, embryo minute in axis of fleshy endosperm.

No member of this rather small family occurs in Peninsular India, but two other genera are found in the Malay Peninsula.

HORTONIA,* *Wight.*

For characters, see Order.—Endemic genus.

L. broadly lanceolate; ped. rather stout . . 1. H. FLORIBUNDA.
L. linear-lanceolate; ped. slender, drooping. . 2. H. ANGUSTIFOLIA.

1. **H. floribunda,** *Wight ex Arn. in Mag. Zool. & Bot.* ii. 546 (1838). **Wawiya,** *S.*

Hk. f. and Th. Fl. Ind. 166. Thw. Enum. 11. *H. acuminata*, Wight, Ic. vi. 14. C. P. 1027.

Fl. B. Ind. v. 115. Wight, Ic. t. 1997 and (*H. acuminata*) 1998, f. 2.

---

* Dedicated to Lady Horton, wife of Sir Robert Wilmot Horton, Bart., Governor of Ceylon from 1831–7.

Shrub, with long cylindrical glabrous branches, buds stellate-puberulous; l. 4–6 in., lanceolate or oval-lanceolate, acute at base, acuminate, acute, glabrous, petiole ½–¾ in.; fl. about ½ in. diam., on longish glabrous ped., in short nearly sessile axillary racemes or panicles, bracts small, caducous; per.-l. numerous, sepaloid ones 3–6, broadly oval, petaloid ones about 20, oblong-strap-shaped, obtuse, spreading; stam. 8 or 9; carp. about 9, oblong, narrow, glabrous; ripe carp. 1–7, about ½ in., ovoid, much compressed, obliquely apiculate, very pulpy, dark crimson.

Var. β, **ovalifolia,** *Hk. f. & Th.* *H. ovalifolia*, Wight, Ic. vi. 16, t. 1998, f. 1. C. P. 159 (161).

L. smaller, 2–3½ in., broadly oval, coriaceous; fl. rather larger, nearly ¾ in.

Forests of the montane zone, 4000–7000 ft.; rather common. Var. β on Adam's Peak. Fl. March–June; yellow.
Endemic.

2. **H. angustifolia,** *Trim. Cat. Ceyl. Pl.* 75 (1885). [PLATE LXXVIII.]
H. floribunda, var. *angustifolia*, Thw. Enum. 12. *H. acuminata*, A. DC. Prod. xvi. 2, 763 (non Wight). C. P. 1026.
Fl. B. Ind. v. 116 (as variety).

Branches very slender; l. 5–9 in., linear-lanceolate, acute at base, much attenuate or caudate, acute or subacute, rather thin, somewhat 3-nerved at base, veins conspicuous; fl. over ½ in. diam., on very slender drooping ped., in few-flowered spreading racemes, bracts linear, persistent, perianth as in *H. floribunda;* stam. 5 or 6; ripe carp. as in the last, but rather smaller and less pulpy.

Moist low country below 2000 ft.; rare. Near Galle; Hiniduma; Morowaka; Labugama. Fl. December, January; pale yellow.
Endemic.
First collected by Moon. A. De Candolle, l. c., confused this with Wight's *acuminata*, which is merely a form of *H. floribunda.* It is, however, difficult to define the differences, which are rather in habit than more important characters.

CXIII.—LAURACEÆ.

TREES or shrubs, l. opp. or alt. and often semi-verticillate, without stip. (*Cassytha* is a leafless parasitic herb), fl. small, regular, bisexual or unisexual and monœcious or diœcious, usually in axillary panicles; perianth with a short tube, segm.

3–8 usually 6, often deciduous; stam. 6–20, usually 9 in 3 rows, inserted on the per.-tube (only 3 in *Hernandia*), a fourth inner row of 3 staminodes sometimes added, fil. flattened, sometimes with 2 large lateral appendages (glands) near the base, anth. 2- or 4-celled, opening by up-curving lids; ov. superior, 1-celled, with a solitary ovule pendulous from top; fruit dry or fleshy, indehiscent, often surrounded at base by (in *Cryptocarya* included in) persistent per.-tube; seed solitary, pendulous, embryo large, cotyledons plane-convex, endosperm 0.

Trees or shrubs; anth.-cells of 3rd row (if present) extrorse (*Perseeæ*).
  Fruit enclosed in per.-tube . . . . . . 1. CRYPTOCARYA.
  Fruit not enclosed in per.-tube.
    Anth. 2-celled . . . . 2. BEILSCHMIEDIA.
    Anth. 4-celled.
      Per. with persistent tube and usually deciduous segm. . . . . 3. CINNAMOMUM.
      Per. with persistent reflexed segm. . . 4. MACHILUS.
      Per. wholly deciduous . . . . . 5. ALSEODAPHNE.
Trees or shrubs; all anth.-cells introrse (*Litseeæ*).
  Anth. 4-celled.
    Bracts several, membranous, deciduous; per.-segm. 6 . . . . 6. ACTINODAPHNE.
    Bracts 4, leafy, forming an involucre; per.-segm. 4 or 6 . . . . 7. LITSEA.
  Anth. 2-celled . . . . 8. LINDERA.
Trees; anth.-cells opening laterally . . . . 10. HERNANDIA.
Leafless parasitic herbs . . . . 9. CASSYTHA.

Our 33 species are all, with the exception of *Alseodaphne*, found only in the moist region, and are about equally divided between the low country and the hills. Species of *Cinnamomum*, *Actinodaphne*, and *Litsea* are very characteristic of the montane forests, nearly all being endemic. *Hernandia* is a seashore plant. Many of the species are but little known, and some of the woods especially need examination as to their value.

1. **CRYPTOCARYA,** *Br.*

Trees, l. alt., entire, penniveined and reticulate, fl. small, in axillary or subterminal panicles; perianth-tube turbinate, segm. 6, concave; stam. 9 in 3 rows, anth. 2-celled, fil. of first and second rows without glands, anth. introrse, fil. of third row with glands, anth. extrorse; style long, stout; fruit completely enclosed in (and often adnate to) the persistent per.-tube.—Sp. 40; 14 in *Fl. B. Ind.*

L. coriaceous, pubescent beneath . . 1. C. WIGHTIANA.
L. thin, glabrous . . . . . . 2. C. MEMBRANACEA.

1. **C. Wightiana,** *Thw. Enum.* 254 (1861). **Gal-mora,** *S.*
C. floribunda, Wight, Ic. v. 2, 12 (non Nees). Thw. Enum. 254. C. P. 414.
Fl. B. Ind. v. 120. Wight, Ic. t. 1829. Bedd. Fl. Sylv. t. 299.

A large tree, branchlets and young parts rusty-pubescent; l. 2–6 in., oval, oblong-oval, or oblong-lanceolate, rounded or subacute at base, shortly acuminate, acute, glabrous above, finely pubescent and whitish beneath, with prominent fulvous-pubescent veins, coriaceous, stiff, petiole $\frac{1}{4}$–$\frac{1}{2}$ in.; fl. numerous, on short rusty-pubescent ped., in spreading axillary pubescent panicles usually shorter than l.; per.-segm. oblong, obtuse, not spreading, pubescent; fruit with persistent per.-tube a little over $\frac{1}{2}$ in., nearly globose, tipped with the withered per.-segm., smooth and shining, purplish-black.

Moist region up to 5000 ft.; rather common. Fl. March, April; pale yellow.
Also in S. India.
Wood moderately hard and heavy, pale brownish-yellow.

2. **C. membranacea,** *Thw. Enum.* 254 (1861). **Tawenna,** *S.*
Meissn. in DC. Prod. xv. 1, 72. C. P. 2701.
Fl. B. Ind. v. 120.

A moderate-sized tree with rounded head, bark rather smooth, reddish-grey, buds rusty-pubescent; l. 3$\frac{1}{2}$–6 in., oblong-lanceolate, acute at base, acuminate, acute, glabrous, thin, slightly glaucous beneath, venation finely reticulate, conspicuous, rather prominent beneath, petiole $\frac{1}{4}$ in., pubescent; fl. few on very short ped., panicles very short, pubescent; perianth pubescent, segm. subacute; fruit a little over $\frac{1}{2}$ in., oblong-ovoid, smooth, purple.

Moist low country to 2000 ft.; rare. Ratnapura, Palabadula, &c., in Sabaragamuwa Prov.; Pasdun Korale. Fl. March, October–December; pinkish-white.
Endemic.
The flowers have a very disagreeable odour. The reticulate venation of the leaves becomes very conspicuous on both sides after drying. Wood heavy, close-grained, greyish-yellow. I am in doubt as to whether the name 'Tawenna' really refers to this tree.

2. BEILSCHMIEDIA, *Nees.*

Tree, l. opp., fl. in axillary panicles; perianth wholly deciduous, tube shortly cup-shaped, segm. 6; stam. 9, arranged as in *Cryptocarya*, anth. 2-celled, staminodes 3 (forming a fourth row), small, cordate; fruit not enclosed in perianth.—Sp. 20; 14 in *Fl. B. Ind.*

B. zeylanica, *Trim. Syst. Cat. Ceyl. Pl.* 75 (1885).
Apollonias zeylanica, Thw. Enum. 253. *Haasia oppositifolia*, Meissn. in DC. Prod. xv. 1, 61. C. P. 2485.
Fl. B. Ind. v. 124 (*B. oppositifolia*).

A large tree, young parts glabrous; l. large, 4–9 in., oblong-oval or oblong-lanceolate, acute at base, obtuse at apex, entire, glabrous and shining, rather thick, venation reticulate, petiole ½–¾ in.; fl. on glabrous ped. panicles on long peduncles, often 2 together, with divaricate branches, per.-segm. short, rounded; glands of third row of fil. cordate; fruit ¾–1 in., on a short thick stalk, oblong-ovoid, blunt, smooth, purple.

Lower montane zone, 3000–4000 ft.; rather rare. Deltota; Hantane; Alagalla; Ambagamuwa. Fl. February–April.
Endemic?
B. Wightii, Hk. f., from the S. Indian hills, figured in Bedd. Fl. Sylv. t. 298, is a very close ally.

3. CINNAMOMUM, *Bl.*

Trees, l. opp. or sub-opp., entire, usually 3-nerved, fl. small, often unisexual, in axillary or subterminal panicles or racemes; perianth-tube short, cup-shaped or campanulate, segm. 6 either deciduous or persistent and enlarged with fruit; stam. 9 in three rows, arranged as in *Cryptocarya*, anth. 4-celled, glands to third row of fil. oval, staminodes (fourth row) 3, sagittate; fruit ovoid, surrounded at base by enlarged persistent perianth, with or without segm.—Sp. 130 (described); 26 in *Fl. B. Ind.*

Per.-segm. persistent; l. strongly 3- or 5-nerved.
  L. oval, very coriaceous . . . . . . 1. C. ZEYLANICUM.
  L. ovate-lanceolate, slightly coriaceous . . 2. C. MULTIFLORUM.
Per.-segm. deciduous.
  L. 3-nerved at base.
    L. under 3 in., broadly oval . . . . . 3. C. OVALIFOLIUM.
    L. over 3 in., ovate-oblong . . . . . 4. C. LITSEÆFOLIUM.
  L. penninerved . . . . 5. C. CITRIODORUM.

1. **C. zeylanicum,** *Bl. Bijdr.* 568 (1825). **Kurundu,** *S.* **Karuva,** *T.*
Herm. Hort. Lugd.-Bat. 129; Mus. 12. Burm. Thes. 62. Fl. Zeyl. n. 145. *Laurus Cinnamomum*, L. Sp. Pl. 369. Roxb. Fl. Ind. ii. 295. Moon Cat. 32. Thw. Enum. 252 (excl. var. β and γ). Meissn. l. c. 16. *C. Wightii*, Meissn. l. c. 11 (?) C. P. 2283, 2284, 4000.
Fl. B. Ind. v. 131. Herm. Hort. Lugd.-Bat. tt. 655, 656. Burm. Thes. t. 27. Wight, Ic. tt. 134, 123. Bedd. Fl. Sylv. t. 262 (*C. Wightii*). Bentl. and Trim. Med. Pl. t. 224.

A moderate-sized tree, bark rather thick, reddish, twigs often compressed, young parts glabrous, buds finely silky;

l. opp. or sub-opp., variable in size, 3–10 in., oval or lanceolate-oval, subacute at base, shortly acuminate, obtuse, glabrous, stiffly coriaceous, strongly 3- or 5-nerved, with fine reticulate venation, shining above, slightly paler beneath, bright pink when young, petiole ½–1 in., stout, flattened above; fl. numerous, on rather long slightly pubescent ped., panicles usually longer than l., lax, peduncles often clustered, long, glabrous or pubescent; perianth about ¼ in., silky, tube short-campanulate, segm. long, oblong-lanceolate, acute, or obtuse, usually persistent; fruit about ½ in., oblong-ovoid, surrounded by much-enlarged perianth, minutely apiculate, dry or slightly fleshy, dark purple.

Moist low country to about 2000 ft.; common. Fl. February; pale yellow.

Also in S. India, Burma, and Malay Peninsula.

The leaves are sweetly aromatic when bruised. The very aromatic bark is the Cinnamon of commerce, and has, doubtless, been collected in Ceylon from wild trees from the earliest times. Ibn Batuta in the fourteenth century, and Nicolo Conti in the fifteenth, both refer to it. But the *cultivation* appears to date only from the Dutch period; it is now general on the S.W. coast from Negombo to Matara. The form grown is the large-leaved variety (C. P. 2285) well figured in Wight, Ic. t. 123; it is kept pollarded so as to produce numerous erect shoots, and not allowed to grow into a tree.

An essential oil is distilled from both the bark and the leaves, the former of which is a large export; the root also affords a camphor. What is known as 'Cinnamon suet' is obtained from the ripe fruit, and is or was used to make scented candles for R. C. Church purposes.

Laurus Cassia, L. (= Fl. Zeyl. n. 146), is made up partly of wild specimens of this, but is chiefly *Litsea zeylanica* (q. v.). *Cinnamomum Cassia*, Nees (the source of Cassia Bark of S. China), is quite another species (figured in Bentl. and Trim. Med. Pl. t. 223).

2. **C. multiflorum,** *Wight, Ic.* i., No. 7 (1839). **Wal-kurundu,** *S.*

Laurus Culilawan, Moon Cat. 32 (? L.). *L. multiflora*, Roxb. Fl. Ind. ii. 298. *C. villosum*, *C. dubium*, *C. perpetuo-florens*, Wight, l. c. *C. zeylanicum*, var. *β*, Thw. Enum. 252. Var. *iners*, Trim. Syst. Cat. Ceyl. 75. *C. iners*, Reinw., var. *δ*, *dubium*, Meissn. l. c. 20. C. P. 2282, 37.

Fl. B. Ind. v. 132. Burm. Thes. t. 28 (copied in Wight, Ic. t. 141). Wight, Ic. t. 126, t. 131, t. 127 (*C. villosum*), and t. 135 (*C. dubium*).

A small tree, young parts silky-pubescent, l. opp. or sub-opp., 2½–5 in., ovate-lanceolate, slightly rounded or subacute at base, acuminate, acute, usually glabrous sometimes finely pubescent beneath, slightly coriaceous, 3-nerved; fl. numerous, on slender silky ped., in more or less umbellate clusters, panicles slender, usually shorter than l.; perianth silky, segm. oval, subacute, persistent; fruit ½ in., oblong-ovoid, apiculate, surrounded at base by enlarged per., on much-thickened ped.

Moist country up to 3000 ft. or higher; common. Fl. July, October, January; pale yellowish-green.

Endemic.

The smaller, more ovate, and thinner leaves, and the smaller flowers are the chief distinctions from *C. zeylanicum*, with which Thwaites combined it. The bark is inferior and not collected. Burmann's figure above quoted is very good (= *C. perpetuo-florens*, Wight), but the text refers chiefly to *Litsea zeylanica*, and Linnæus quotes it for his *L. Cassia.* The plant referred by Meissner to *C. iners*, Reinw. (C. P. 37), has rounded or subcordate bases to the leaves, and was collected by Gardner on Adam's Peak.

3. **C. ovalifolium,** *Wight, Ic.* i., No. 7 (1839).
C. zeylanicum, var. γ, Thw. Enum. 252. Meissn, l. c. 22. C. P. 263.
Fl. B. Ind. v. 133. Wight, Ic. t. 125.

A small tree, much branched, branchlets stout, quadrangular or compressed, young parts silky-pubescent; l. numerous, small, 1–3 in., broadly oval, ovate-oval, or subrotundate, rounded or subacute at base, obtuse at apex, usually finely pubescent on both sides but becoming glabrous and shining above, very stiffly coriaceous, obscurely 3-nerved, the lat. veins vanishing beyond the middle, petiole very stout; fl. on short pubescent ped., racemes corymbose, axillary, usually shorter than l.; per.-segm. ovate, acute, deciduous; fruit over $\frac{1}{2}$ in., ovoid, apiculate, surrounded at base by rather shallow truncate cup of perianth-tube.

Forests and bushy places in mountain zone above 4500 ft.; rather common. Nuwara Eliya; Elk Plains; Totapala; Rangala; Wattakelle. Fl. March–April, September; greenish-white.

Endemic.

Formerly considered by Thwaites as a mountain variety of *C. zeylanicum*, the true Cinnamon, but seems a quite distinct species. Varies in foliage. At the highest elevations the l. are barely 1 in., rotundate, and often slightly cordate at base.

4. **C. litseæfolium,** *Thw. Enum.* 253 (1861). **Kudukurundu,** *S.*
Meissn. l. c. 22. C. P. 392.
Fl. B. Ind. v. 132.

A large tree, 50–60 ft., branched above, young parts pubescent; l. 3–5 in., ovate-oblong or ovate-lanceolate, rounded or subacute at base, obtuse at apex, quite glabrous, paler beneath, rigidly coriaceous, obscurely 3-nerved, the lat. nerves vanishing beyond the middle, petiole $\frac{1}{2}$–$\frac{3}{4}$ in.; fl. on silky ped., numerous, panicles long, lax, spreading, much exceeding l.; per.-segm. oblong-oval, obtuse, soon deciduous; fruit not seen.

Montane zone; very rare. Haputale at 5000 ft. (Thwaites). Fl. April–May; greenish-white.

Endemic.

The bark is quite inodorous (Thwaites). I have not met with this, and have seen only the C. P. specimens.

5. **C. citriodorum,** *Thw. Enum.* 253 (1861). **Pengiri-kurundu,** *S.*

Meissn. l. c. 22. C. P. 393.

Fl. B. Ind. v. 134.

A moderate-sized tree with spreading branches, young parts puberulous; bark thick, rather smooth, orange-grey; l. rather small, $1\frac{1}{2}$–3 in., lanceolate or oval, acute or rounded at base, obtuse, glabrous, very hard and coriaceous, shining above, penninerved, veins very obscure, petiole $\frac{1}{2}$ in.; fl. numerous, on short ped., panicles lax, spreading, longer than l., per.-segm. oblong-oval, obtuse, deciduous; fruit $\frac{1}{2}$ in., oblong-ovoid, surrounded at base by shallow, truncate, woody cup of per.-tube, dark purple.

Moist low country; very rare. Sabaragamuwa Dist. and near Galagama, between 1000–2000 ft. (Thw.). Fl. April; greenish-white.

Endemic.

The bark and leaves have a very agreeable odour of lemon and cinnamon combined. Wood rather heavy, close-grained, yellowish.

4. **MACHILUS,** *Nees.*

Tree, l. alt., penninerved, fl. rather large (for Order), in axillary or subterminal panicles; per.-tube very short, segm. 6, long, persistent with fruit; stam. 9, in 3 rows, anth. 4-celled, fil. of first and second rows without glands, anth. introrse, fil. of third row with two glands, anth. extrorse, staminodes (fourth row) 3, stalked, cordate; fruit globose, seated on spreading or reflexed enlarged perianth.—Sp. 15; 13 in *Fl. B. Ind.*

M. macrantha, *Nees in Wall. Pl. As. Rar.* ii. 70 (1831). **Ululu,** *S.*

Thw. Enum. 254. *M. glaucescens*, var. *zeylanica*, Meissn. l. c. 40. Trim. Syst. Cat. 75. C. P. 2270.

Fl. B. Ind. v. 140. Wight, Ic. 1824 and (*M. glaucescens*) 1825. Bedd. Fl. Sylv. t. 264.

A large tree, young parts glabrous, l. 3–6 in., oblong-oval, rounded, often unequal at base, slightly acuminate, obtuse, glabrous, rather coriaceous, pale or rather glaucous beneath, venation finely reticulate, not conspicuous, petiole long, $\frac{3}{4}$–$1\frac{1}{4}$ in.; fl. numerous, on pubescent ped., panicles several, near end of branch, 6–8 in., stout, puberulous; perianth silky-pubescent,

segm. lanceolate, subacute; fil. hairy; fruit nearly ¾ in., smooth, dark green dotted with white.

Moist region from 1500–4000 ft.; rather common. Fl. December–February; pale yellow.

Also on mountains of S. India.

Wood light, soft, pale yellow, or nearly white.

5. ALSEODAPHNE, *Nees.*

Large tree, l. alt., crowded at ends of branchlets, penninerved; fl. in lax axillary panicles; perianth cut almost to base into 6 segm., deciduous; stam. 9 in three rows, as in *Cryptocarya*, &c., staminodes (fourth row) 3, small, sagittate; fruit large, oblong-oval supported on a thickened swollen stalk, without a supporting persistent perianth.—Sp. 15; 9 in *Fl. B. Ind.*

Alseodaphne was regarded merely as a section of *Persea* in Gen. Plant., but has full generic rank in the Fl. B. Ind.

A. semecarpifolia, *Nees in Wall. Pl. As. Rar.* ii. 72 (1831). **Wéwarani,** *S.* **Ranai, Yavaranai,** *T.*

Meissn. l. c. 28. *Persea semecarpifolia*, Trim. Syst. Cat. Ceyl. 75. C. P. 2269 (2272).

Fl. B. Ind. v. 144. Wight, Ic. tt. 1826, 1827. Bedd. Fl. Sylv. t. 297.

A large tree, much branched, bark thick, vertically furrowed, yellowish-brown, branchlets somewhat whorled, twigs numerous, slender, glabrous, lenticellate; l. appearing almost verticillate from crowding, 3½–5½ in., oblong-oval or oblong-lanceolate or somewhat obovate, tapering to base, acute obtuse or rounded at apex, glabrous, rather thick, usually somewhat glaucous beneath, finely reticulate, petiole variable, ¼–1 in.; fl. on slender ped., panicles exceeding l. on long peduncles, very lax; per.-segm. slightly puberulous, oval, obtuse, the outer 3 rather smaller; fruit ¾–1 in., oblong-ovoid, blunt, smooth, ped. ½–¾ in., stout, cylindrical, worted.

Forests of the dry region, common. Fl. Aug., Sept., April; yellowish-green.

Also in Southern India.

Varies in the shape and size of the leaves; our plant is called var. *angustifolia* by Meissner. Wight's Ic. t. 1827 and Beddome's figures show a still smaller-leaved form from India. There are apparently specimens in Willdenow's Herbarium under the name of *Tabernæmontana tenuifolia* (see note by Meissner, l. c.). A specimen of Thwaites's (in Herb. Perad.) is localised Reigam Korale, which must be an error, as the tree is confined to the dry region. One of our best timber trees. The wood is exported from Trincomalie; it is heavy, durable, straight-grained, pale greyish-orange, and can be obtained of large size.

6. ACTINODAPHNE, *Nees.*

Small trees, l. semi-verticillate at ends of the branchlets (rarely opp.), usually penninerved (rarely 3-nerved at base), fl. small, diœcious, in small axillary clusters or umbels, bracts several, small, membranous, deciduous; per.-tube short, segm. 6, usually deciduous; stam. (reduced to staminodes in fem. fl.) usually 9 in three rows, fil. of first and second rows without glands, of third row with glands, anth. 4-celled, all introrse; fruit more or less globose, seated on flattened or concave enlarged per.-tube.—Sp. 50; 24 in *Fl. B. Ind.*

A genus scarcely separable from *Litsea*. All our species are endemic.

L. under 5 in., semi-whorled.
  L. rufous-tomentose beneath . . . . . 1. A. MOLOCHINA.
  L. glabrous, usually glaucous beneath.
    L. linear-oblong . . . . 2. A. STENOPHYLLA.
    L. lanceolate . . . . 3. A. ELEGANS.
    L. oval.
      Young parts rusty-tomentose . . . 4. A. GLAUCA.
      Young parts glabrous.
        L. penninerved . . . . . . 5. A. PISIFERA.
        L. 3-nerved at base . . . . . 6. A. AMBIGUA.
L. over 5 in., opp., very tomentose beneath . . 7. A. SPECIOSA.

1. **A. molochina,** *Nees, Syst. Laurin.* 603 (1836).
Thw. Enum. 257. Meissn. l. c. 211. C. P. 2273.
Fl. B. Ind. v. 150. Wight, Ic. t. 1843.

Branchlets stout, bark whitish, young parts covered with very dense rufous tomentum; l. 4–6 in a whorl, variable, usually small, $1\frac{1}{2}$–$2\frac{1}{2}$ in., broadly obovate-oval, acute at base, rounded or shortly acuminate, acute at apex, glabrous above when mature, rufous-tomentose becoming glabrous beneath, coriaceous and very stiff, penninerved, veins conspicuous beneath impressed above; fl. on short, hairy ped., bracts rounded, rufous-hairy, perianth rufous-hairy, segm. oblong, obtuse, persistent; fruit globose, a little over $\frac{1}{4}$ in., apiculate, persistent per.-tube flattened.

Var. β, **Moonii,** *Hk. f.* *A. Moonii*, Thw. Enum. 256. C. P. 74.
A. molochina, var. *glabrescens*, Meissn. l. c. 211.

L. narrower, acuminate, subacute, less coriaceous and less tomentose.

Forests of upper montane zone, especially at the highest elevations; common.
Var. β, Adam's Peak (Moon); Dolosbagie. Fl. Feb.–April; brownish-yellow.
Endemic.
Very variable in the foliage; when young the leaves are densely

covered on both surfaces with rufous or yellowish-white tomentum; this soon rubs off the upper surface, and ultimately the lower surface also becomes glabrous and is usually then glaucous in colour.

2. **A. stenophylla,** *Thw. Enum.* 256 (1861).
A. Thwaitesii, Meissn. l. c. 212. C. P. 304 (2491).
Fl. B. Ind. v. 150.

About 20–30 ft., bark yellowish-grey, young parts and bud-scales pubescent; l. 4–7 in a whorl, 2–4 in., linear-oblong or linear, acute at base, very obtuse, glabrous on both sides, finely reticulate, rather thick, glaucous-white beneath; fl. on very short ped., crowded, bracts and perianth silky, segm. deciduous; fruit $\frac{3}{8}$ in., globose, purple, persistent per.-tube shallowly cup-shaped.

Moist and intermediate region, 1–4000 ft.; rare. Deltota; abundant in the Uva patana country. Fl. April, May; pale yellow.
Endemic.
A. Thwaitesii, Meissn., is a form with rather broader leaves.

3. **A. elegans,** *Thw. Enum.* 256.
Meissn. l. c. 212. C. P. 2277.
Fl. B. Ind. v. 150.

Much branched, bark smooth, greyish-brown, young parts rufous-hairy, bud-scales nearly glabrous; l. 4 or 5 in a whorl, 3–5 in., narrowly lanceolate, acute at base, attenuate, acute, glabrous, dark green and shining above, glaucous or white beneath, penninerved, venation inconspicuous minutely reticulate, petiole short, slender, cylindrical; fl. on short ped., bracts very deciduous; per.-segm. rounded, finely pubescent, deciduous; fruit $\frac{1}{4}$–$\frac{3}{8}$ in., red, persistent per.-tube flattened, circular.

Moist region, to 3000 ft.; rare. Hewesse; Ambagamuwa; Hunasgiriya. Fl. Dec.–Feb.; pale greenish-yellow.
Endemic.
Meissner erroneously quotes C. P. 3009 for this.

4. **A. glauca,** *Nees, Syst. Laurin.* 599 (1836).
Thw. Enum. 256 (part). *A. glauca*, var. *Walkeri*, Meissn. l. c. 213. C. P. 3518.
Fl. B. Ind. v. 150.

Young shoots rusty-tomentose; l. 4–7 in a whorl, 2–3 in., oval or oblong-oval, rounded at both ends or somewhat tapering at base, glabrous, coriaceous, very glaucous nearly white beneath, venation minute, reticulate, raised and conspicuous when dried, petiole stout, at first rufous-tomentose, afterwards glabrous; fl. rather large (for genus) on rather long tomentose ped., per.-segm. deciduous; fruit small, $\frac{1}{4}$ in., persistent per.-tube a very shallow truncate cup.

Upper montane zone, rare. Pedurutalagala. Fl. Feb.; pale yellow.
Endemic.
The young leaves are purplish-pink.

5. **A. pisifera,** *Hk. f. in Fl. B. Ind.* v. 151 (1886).
A. glauca. Thw. Enum. 256 (part); Meissn. l. c. 213 (excl. var. β). C. P. 2536.
Fl. B. Ind. v. 151.

Branchlets slender, young parts glabrous; l. 4–6 in a whorl, 2–3 in., oval, acute at base, subacute, margin recurved, quite glabrous, glaucous beneath, slightly coriaceous, petiole ½ in., slender; fl. (only seen in bud) in globose clusters, bracts numerous, very obtuse, glabrous; fruit not seen.

Upper montane zone, rare. Elk Plains; Dumbanagala, Rangala. Fl. October.
Endemic.
Meissn. l. c. 211 refers this to his *A. molochina*, var. *subtriplinervis*. The locality given in Fl. B. Ind. belongs to C. P. 3518, not to C. P. 2536. The material to hand is very scanty. The name *pisifera* refers to the sessile unopened globose clusters of flowers in the axils of fallen leaves.

[*A. salicina*, Meissn., is recorded (DC. Prod. l. c. 212) as from Ceylon Hb. Wight. The locality is, doubtless, erroneous.]

[*A. lanata*, Meissn., another Nilgiri species, is also recorded for Ceylon (l. c. 219), but, no doubt, incorrectly.]

[*A. Hookeri*, Meissn., is also given (l. c. 218) for Ceylon, but there is no evidence of its occurrence here.]

6. **A. ambigua,** *Hk. f. in Fl. B. Ind.* v. 153 (1886).
Litsæa zeylanica, var. β, Thw. Enum. 257. *L. ambigua*, Meissn. l. c. 226; Trim. Syst. Cat. Ceyl. 76. *L. zeylanica*, var. *venosa*, Meissn. l. c. 226. C. P. 72, 2278, 2280.
Fl. B. Ind. v. 153.

Branches slender, young parts glabrous; l. 3–8 in., in an imperfect whorl, 2–4½ in., oblong-lanceolate or oval, subacute at base, acute or obtuse, glabrous, glaucous or nearly white beneath, more or less 3-nerved at base, stiff; fl. on short, silky ped., crowded, clusters dense, globose, bracts large, concave, nearly glabrous, per.-segm. deciduous; fruit ovate-ovoid, rather over ¼ in., bluntly pointed, persistent per.-tube slightly enlarged.

Var. β, **orbicularis,** *Trim.* *Litsæa orbicularis*, Thw. Enum. 258. *Actinodaphne molochina*, var. γ, *subtriplinervis*, Meissn. l. c. 211. C. P. 2699.

L. very broadly oval or orbicular, 1–2 in., often revolute at margin.

Montane zone, 4000–6000 ft.; rather common. Ambagamuwa; Hantane; Maskeliya; N. Eliya; Kandapolla, Wattakelle. Var. β, Ambagamuwa; Maskeliya; Hakgala. Fl. Feb.; yellow.

Endemic.

I follow Sir J. Hooker in uniting these, and placing them under *Actinodaphne.* Var. β, which I should prefer to keep separate, is very like some forms of *A. molochina* to which Meissner placed it.

7. **A. speciosa,** *Nees, Syst. Laurin.* 602 (1836).
Thw. Enum. 257. Meissn. l. c. 219. C. P. 674.
Fl. B. Ind. v. 153. Wight, Ic. t. 1842.

A tree, 20–40 ft., slightly branched, bark thick, smooth, grey, branchlets stout, densely covered with rufous tomentum, bud-scales large, obtuse, very silky outside; l. opp. or 3 together, large, 5–9 in., broadly oval or rotundate, shortly acuminate, obtuse, glabrous above when mature, covered beneath (and above when young) with very dense long ferrugineous wool, very thick, venation very prominent and conspicuous beneath and impressed above, penninerved but somewhat 3-nerved at base; fl. on woolly ped., perianth tomentose, segm. deciduous; fruit $\frac{5}{8}$ in., ovoid, persistent per.-tube very shallowly cup-shaped.

Var. β, **Candolleana,** *Hk. f. A. Candolleana,* Meissn. l. c. 219. C. P. 3371.

L. narrower, acute at base, less tomentose.

Forests of upper montane zone, 5000–8000 ft.; common. Var. β extending down to 4000 ft. Fl. March, April; yellowish-brown.

Endemic.

The beautiful and remarkably large velvety leaves are very conspicuous objects in the hill-forests when young, and are called 'elephants' ears;' the tomentum is very dense, and of a fine ruddy-orange colour. Wood rather heavy, smooth, yellowish.

7. **LITSEA,*** *Lam.* (1789). (*Tetranthera,* Jacq. [1797]).

Trees, rarely shrubs, l. alt., penninerved (rarely 3-nerved at base), fl. small, diœcious, in small umbels, bracts 4, concave, forming an involucre of 2 pair, imbricate before expansion and looking like sep.; per.-tube long or short, segm. 4, 6, or 8, usually deciduous, or none; stam. usually 9 (often 6 or 8 or 12 or 20), in three or four rows, fil. of first and second rows with glands, of third and fourth without glands, anth. 4-celled, all introrse; fruit globose or ovoid, often succulent, seated on flattened or shallowly cup-shaped much-enlarged per.-tube.—Sp. 140; 65 in *Fl. B. Ind.*

* From the Chinese, Litsé, the name of *C. chinensis,* Lam.

L. penninerved.
  Perianth-segm. 0.
    L. finely tomentose beneath . . . 1. L. TOMENTOSA.
    L. glabrous.
      Umbels in corymbs . . . . . 2. L. CHINENSIS.
      Umbels solitary . . . . . . 3. L. UNDULATA.
  Perianth-segm. 4 or 6, usually deciduous (*Cylicodaphne*).
    Umbels solitary or fascicled.
      L. tomentose beneath.
        L. under 10 in., oval.
          L. acute; stam. 9 . . . . . 4. L. CAULIFLORA.
          L. obtuse; stam. 6 . . . . . 5. L. HOOKERIANA.
        L. over 12 in., linear-lanceolate . . 6. L. NEMORALIS.
      L. glabrous beneath.
        L. obtuse or rounded . . . . . 7. L. OVALIFOLIA.
        L. more or less acuminate.
          Lat. veins few, strong, forming large loops . . . . . . 8. L. GLABERRIMA.
          Lat. veins more numerous, slender. 9. L. ITEODAPHNE.
    Umbels in racemes . . . . . . 10. L. GARDNERI.
L. 3-nerved at base (*Tetradenia*).
  Young l. and shoots rufous-tomentose . . 11. L. FUSCATA.
  Young l. and shoots glabrous . . . 12. L. ZEYLANICA.

1. **L. tomentosa,** *Heyne in Wall. Cat.* n. 2550 (1828). **Kosbaḍa, Landittaṉ,** *S.*

Tetranthera tomentosa, Roxb., Thw. Enum. 254. C. P. 2275.
Fl. B. Ind. v. 157. Wight, Ic. t. 1834.

A moderate-sized tree, bark thin, grey, not furrowed, branchlets stout, yellow-tomentose, bud-scales large, pubescent; l. numerous, rather crowded at ends of branches, large, 4–10 in., oval or obovate-oval, acute at base, very shortly acuminate, acute, glabrous above, finely tomentose-pubescent and yellowish-white beneath, rather thick, veins prominent beneath; fl. numerous, on hairy ped., umbels rather large, $\frac{2}{3}$ in. diam., solitary, on long drooping peduncle, globose before expansion, bracts large, rotundate, tomentose; per.-tube short, hairy, segm. 0; stam. about 20, fil. slender, hairy, glands long-stalked, capitate; fruit $\frac{3}{8}$ in., depressed-globose.

Moist region up to 4000 ft.; common. Fl. October; pale yellow. Also in Peninsular India.

In the fem. fl. the stam. are transformed into strap-shaped staminodes. Wood moderately hard and heavy, close-grained, yellowish.

2. **L. chinensis,** *Lam. Encycl. Meth.* iii. 574 (1789). **Bomi, Bombi,** *S.* **Elumpurukki,** *T.*

Tetranthera apetala, Roxb., Moon Cat. 69. *T. Roxburghii*, Nees, Thw. Enum. 255. *T. laurifolia*, Jacq., var. *Roxburghii*, Meissn. l. c. 179. C. P. 2276.

Fl. B. Ind. v. 157 (*L. sebifera*). Roxb. Pl. Cor. ii. 147 (*L. apetala*).

A moderate-sized tree, branchlets slender, glabrous, young parts silky, buds small, hairy; l. somewhat crowded at ends of branchlets, variable, 2½–6 in., usually oblong-oval, acute at base, usually obtuse, glabrous on both sides, not thick, venation conspicuous beneath, petiole ½–¾ in.; fl. numerous, crowded, nearly sessile, umbels ½–¾ in., globose before expansion, arranged in axillary stalked corymbs or umbels; per.-tube long, silky, segm. 0; stam. about 20, fil. very hairy, glands long-stalked; fruit about ¼ in., nearly globose, purple.

Low country up to 3000 ft.; very common. Fl. January–March; greenish-yellow.

India, Burma, Malaya, China, Australia.

Lamarck's name has long priority over Persoon's adopted in Fl. B. Ind. Wood much used in house-building; bark glutinous, and used medicinally as an external application to bruises, &c.

3. **L. undulata,** *Hk. f. in Fl. B. Ind.* v. 158 (1886).
Tetranthera ligustrina, Thw. Enum. 254 (non Nees). *T. ligustrina*, var. *celastroides*, Meissn. l. c. 180. C. P. 2273.
Fl. B. Ind. v. 158.

A tree, young branchlets roughly pubescent; l. 3–6 in., linear-oblong, acute at base, obtuse, glabrous except on midrib beneath, finely reticulate, petiole long, pubescent; umbels solitary on stout pubescent peduncles, bracts rotundate, pubescent; per.-segm. 0; fil. hairy; fruit over ¼ in., globose.

Moist low country, 1000–2000 ft.; rare. The only specimens I have seen are the C. P. ones, labelled Peradeniya.

Endemic.

True *L. ligustrina* (Nees), a native of the Nilgiris, is figured in Wight, Ic. t. 1835.

L. polyantha, Juss. (*T. monopetala*, Roxb.).—Brandis (Forest Fl. 381) gives this for Ceylon. It is not included in Thw. Enum., but C. P. 326 may be it. The specimens, however (collected at Badulla), consist of leaves only (see Fl. B. Ind. v. 163).

4. **L. cauliflora,** *Trim.* **Rat-kéliya,** *S.*
Tetranthera cauliflora, Moon Cat. 69. *T. longifolia*, Nees, Syst. Laurin. 528. Thw. Enum. 255 (excl. var. γ). C. P. 223.
Fl. B. Ind. v. 167 (*L. longifolia*).

A small tree, bark rough, grey, young parts brown-tomentose; l. 4–10 in., oval, acute or rounded at base, acute, usually glabrous above when mature, more or less rufous-tomentose beneath, rather coriaceous, venation prominent beneath, petiole ½–1 in., stout; fl. on very short ped., umbels small, 4–10 fld., on short pubescent peduncles clustered on small bosses in axils of fallen l., often on old branches; bracts pubescent, caducous; per.-tube long, top-shaped, pubescent,

segm. 6, oblong, obtuse, pubescent, deciduous; stam. 9, fil. hairy at base; fruit $\frac{1}{3}$ in., globose.

Moist region up to 3000 ft. or higher; common. Fl. November–March.

Endemic.

I have restored Moon's very appropriate specific name in place of the later one of Meissner, which is scarcely applicable.

5. **L. Hookeriana,** *Meissn. in DC. Prod.* xv. 1, 188 (1864).
Fl. B. Ind. v. 166. *L. nemoralis* (part), Trim. Syst. Cat. Ceyl. 76 (non Thw.).

'Bark pale, branchlets very stout with large leaf-scars; l. 4–6 in., elliptic or obovate, obtuse, glabrous above, densely softly brown-tomentose beneath, thickly coriaceous, not reticulate-veined, petiole $\frac{1}{2}$ in., very stout; umbels obscurely pubescent, bracts concave; perianth funnel-shaped, silky, segm. oblong, glabrous; stam. 6.'

Only known from Gardner's specimens, n. 1765, which are not localised.

The above description is taken from Fl. B. Ind. When in Syst. Cat. Ceyl. Pl. I erroneously referred this to *L. nemoralis*, I had seen no specimen. It is perhaps not distinct from *L. cauliflora.*

6. **L. nemoralis,** *Thw. Enum.* 255 (1861) (sub *Tetranthera*).
C. P. 2921.
Fl. B. Ind. v. 167.

A shrub, 10–12 ft., stem scarcely branched, upper part densely covered with ferrugineous velvety tomentum; l. few, very large, 12–18 in., linear-lanceolate, tapering to both ends, softly silky-villous on both sides, especially when young, the upper surface dark green except the midrib, becoming glabrous when mature, the lower surface beneath the hair glaucous, petiole 1 in., very stout, villous; umbels small, globose in bud, in clusters on bosses in axils of fallen l. on old wood, bracts glabrous; per.-segm. 6, long, glabrous, deciduous; fruit $\frac{3}{8}$ in., ovoid-globose on large flattened circular per.-tube.

Forests in moist low country; very rare. Near Galle (Gardner); Mapalagama (Thwaites). Fl. October.

Endemic.

The foliage is extremely beautiful.

7. **L. ovalifolia,** *Thw. Enum.* 256 (sub *Tetranthera*) (1861).
Lepidadenia ovalifolia, Wight, Ic. v. 2, 15 (1852). *Cylicodaphne Thwaitesii*, var. *a*, Meissn. l. c. 208. C. P. 167.
Fl. B. Ind. v. 173. Wight, Ic. t. 1839.

A tree, 30–40 ft., bark rough, brown, branchlets stout, young parts puberulous; l. $2\frac{1}{2}$–6 in., oval or oblong-oval,

rounded or subacute at base, obtuse or rounded at apex, glabrous, coriaceous, paler beneath, violet-pink when young, petiole $\frac{1}{2}$–$\frac{3}{4}$ in., stout; fl. on short ped., umbels small, about 4-flowered, on longish pubescent peduncles in small clusters from axils of present or fallen l., bracts very concave, puberulous; per.-segm. 4–8, linear-oblong, obtuse, deciduous; stam. 8–16 or more (usually 12), very irregular; fruit $\frac{1}{3}$ in., ovoid-globose, purple, per.-tube much dilated.

Montane zone, 3000–7000 ft.; common. Hantane; Deltota; Hunasgiriya; N. Eliya; Badulla; Haputale; Rangala. Fl. April, May, September; pale yellow.

Endemic.

8. **L. glaberrima,** *Thw. Enum.* 255 (sub *Tetranthera*) (1861).

Tetranthera longifolia, var. γ, Thw. Enum. 255. *T. nervosa*, Meissn. l. c. 187. *T. læta*, var. γ, *glauca*, Meissn. l. c. 187. *Cylicodaphne Thwaitesii*, var. γ, *angustata*, Meissn. l. c. 208. C. P. 79, 2274, 2606.

Fl. B. Ind. v. 173.

A small tree, bark smooth, reddish-brown, branches slender, young parts slightly pubescent; l. $3\frac{1}{2}$–7 in., lanceolate or oval-lanceolate, acute at base, acuminate, acute or obtuse, quite glabrous, more or less coriaceous, venation prominent beneath, lat. veins few, forming large arches within the margin, petiole $\frac{1}{2}$ in., glabrous; fl. on pubescent ped., umbels very small, 4-flowered, on slender peduncles, in clusters in axils of present or fallen l. often from old wood, bracts rounded, nearly glabrous; per.-segm. oblong, obtuse, deciduous; stam. 9, fil. nearly glabrous; fruit $\frac{1}{2}$ in., oblong or globose, dark purple.

Montane zone, 4000–7000 ft.; rather common. Alagalla; Ambagamuwa; Deltota; Hantane; Horton Plains; Nitre Cave Dist. Fl. Feb.–May; white.

Endemic.

I think there are two varieties here; C. P. 2274 has a globose fruit, and larger and less coriaceous leaves. The fil. of both inner rows of stam. are sometimes provided with glands.

9. **L. iteodaphne,** *Thw. Enum.* 255 (*Tetranthera*) (1861) (*? Nees*).

Cylicodaphne Thwaitesii, var. β and var. γ (part), Meissn. l. c. 208. *C. Walkeri*, Meissn. l. c. 208. C. P. 10, 2605.

Fl. B. Ind. v. 173.

A small tree 20–30 ft., or a large shrub, bark rather rough, twigs slender, young parts finely silky; l. variable, $1\frac{1}{2}$–7 in., narrowly oval or lanceolate or oblong-oval, rounded or acute at base, acuminate, subacute, glabrous, coriaceous, paler beneath, venation inconspicuous, petiole short; umbels small, on short slightly pubescent peduncles, solitary or clustered in l.-axils, bracts rounded, silky, fl. about 4, nearly sessile;

perianth-tube campanulate, segm. 4, rounded, deciduous, stam. usually 8; fruit ½ in., oblong-ovoid, purplish-red.

Var. β, **angustata,** Meissn. l. c. 208 (in part). C. P. 360.

L. narrower, sometimes reaching 10 in., linear-lanceolate, very acuminate, glaucous beneath, fruit over ½ in., crimson.

Montane zone, 4000–6000 ft.; rather common. Hantane; Dimbula; Adam's Peak; Haputale. Var. β, also in moist low country. Ambagamuwa; Morawak Korale; Madagatte, S. Prov.; Lunugala, Uva. Fl. Jan.–April; greenish-white.

Endemic.

Very variable in foliage; possibly two different plants are included in var. β. There is doubt as to this being the *T. iteodaphne* of Nees, Syst. Laur. 542 (from Ceylon), as he describes 6 segm. to the perianth. Of *C. Walkeri*, Meissn., I have seen only 2 leaves (from Walker, n. 1832) kindly sent me by Sir J. Hooker.

10. **L. Gardneri,** *Thw. Enum.* 255 (*Tetranthera*) (1861).
Cylicodaphne zeylanica and *C. rigida*, Meissn. l. c. 201. C. P. 40.
Fl. B. Ind. v. 176.

A tree, 40–50 ft., bark grey, branchlets stout, marked with l.-scars, young parts pubescent; l. large, 4–12 in., oval or oblong-oval, acute at base, obtuse or rounded at apex, glabrous above, minutely white-tomentose beneath, stiffly coriaceous, with many prominent lat. veins, pale violet-coloured when young, petiole ½–1 in., very stout, umbels about ½ in., on long stout pubescent stalks arranged in axillary racemes shorter than l., bracts rotundate, silky; fl. few, sessile; per.-segm. 6 or 4, white-silky outside, deciduous, stam. usually 9; fruit ½ in., ovoid.

Montane zone, 4000–6000 ft.; rare. Hewahette; Nuwara Eliya; Maturata. Fl. Jan.; pale yellow.

Endemic.

This is near *L. Wightiana*, Wall., of the S. Indian mountains, figured in Bedd. Fl. Sylv. t. 293 and Wight, Ic. t. 1833.

11. **L. fuscata,** *Thw. Enum.* 258 (1861).
Meissn. l. c. 221. C. P. 413.
Fl. B. Ind. v. 178.

A small tree, bark smooth, young shoots finely rufous-tomentose, bud-scales conspicuous, obtuse, silky; l. 2½–4 in., lanceolate or oval, acute at base, shortly acuminate, subacute, quite glabrous and light green above when mature, very finely white-tomentose and glaucous beneath (when young ferrugineo-tomentose on both sides), coriaceous, 3-nerved at base; umbels small, nearly sessile in clusters in axils of present and fallen l., fl. small, on very hairy ped.; per.-tube very hairy, segm. deciduous; fruit ⅓ in., globose, on large thickened flat circular per.-tube.

Upper montane zone, 6000–8000 ft.; rather common. About Nuwara Eliya, frequent. Fl. Jan., Feb.; yellowish.
Endemic.

12. **L. zeylanica,** *Nees in Amœn. Bot. Bonn.* fasc. I, 58 (1823).
Dawul-kurundu, Kudu-dawula, *S.*
Herm. Mus. 26. Fl. Zeyl. n. 146 (part). *Laurus Cassia*, L. Sp. Pl. (part); Moon Cat. 32.
Thw. Enum. 257 (excl. var. β). *Tetradenia zeylanica*, Nees in Wall. Pl. As. Rar. ii. 64. C. P. 2281.
Fl. B. Ind. v. 178. Wight, Ic. tt. 132, 1844.

A small tree, bark thick, smooth, grey, branchlets slender, buds small, minutely puberulous; l. numerous, closely placed at ends of branches, 3–5 in., lanceolate, tapering to both ends, obtuse or subacute, glabrous, not coriaceous, somewhat undulate, more or less glaucous beneath, distinctly 3-nerved at base, minutely reticulate, petiole $\frac{1}{3}$–$\frac{3}{4}$ in., slender; umbels small, sessile, clustered, 4- or 5-flowered, bracts slightly silky; per.-tube rather long, hairy, segm. 4, acute, deciduous; fruit either $\frac{1}{2}$ in. oblong-ovoid apiculate, or $\frac{1}{3}$ in. globose not apiculate, dark purple.

Var. β, **rubrinervia,** Meissn. l. c. 226. C. P. 3449.

Leaves coriaceous and thick, not glaucous beneath; the main veins obscure, the fine reticulation very conspicuous.

Moist region up to 4000 ft., very common. Var. β, Ratnapura. Fl. April.
E. Bengal, Burma, Malaya. Var. β in S. India.
Commonly known as 'Wild Cinnamon,' and like it in foliage; but the leaves have scarcely any scent or flavour. Wood rather light, moderately hard, even-grained, pale orange; used in house-building.

8. LINDERA, *Thunb.*

Trees, l. semi-whorled, obscurely 3-nerved at base, umbels 3- or 4-flowered, in axils of fallen l., bracts 4; fl. as in *Litsea*, but per.-segm. 7–9 and anth. all introrse, 2-celled; fruit globose or ovoid, seated on persistent per.-tube.—Sp. 60; 18 in *Fl. B. Ind.*

L. lancifolia, Thw. Enum. 257 (*Daphnidium*) (1861).
Meissn. l. c. 229. C. P. 356.
Fl. B. Ind. v. 187.

A tree, young parts fulvous-pubescent; l. semi-whorled, 2–3 in., lanceolate, acute at both ends, glabrous, white beneath, obscurely 3-nerved at base, rather coriaceous; umbels sessile, bracts fulvous-hairy; fl. subsessile; fruit not seen.

Montane zone, very rare. I have only the C. P. specimen collected

at Haputale in April; it is in very young flower, the anthers are 2-celled, and it appears to be truly a *Lindera.*

9. **CASSYTHA,** *L.*

Leafless parasites with twining filiform stems provided with suckers, fl. minute, usually bisexual, bracteate, in short spikes or heads; per.-tube short, becoming much enlarged and fleshy and enclosing fruit, segm. 6, in 2 rows; stam. 9, in three rows, fil. of first and second rows without glands, of third row with 2 globose glands, anth. all 2-celled, of 2 outer rows introrse of inner row extrorse; fruit enclosed in but free from enlarged succulent per.-tube.—Species 15; 2 in *Fl. B. Ind.*

Has the habit of *Cuscuta* precisely.

Fruit globose . . . . . 1. C. FILIFORMIS.
Fruit oblong-ovoid . . . . 2. C. CAPILLARIS.

1. **C. filiformis,** *L. Sp. Pl.* 35 (1753).
Moon Cat. 33. Thw. Enum. 258. C. P. 1923.
Fl. B. Ind. v. 188. Wight, Ic. t. 1847.

Stems very long, cord-like, twined and matted together, branched, glabrous or pubescent, dark green; fl. small, sessile, in very short lax divaricate spikes, bracts small, ciliate; per.-tube short, segm. 6 in two rows, outer row short, inner large, acute, concave, valvate; fruit about $\frac{1}{4}$ in., globose, enclosed in fleshy per.-tube and crowned with erect per.-segm., white, smooth.

Parasitic on various bushes in the low country, especially near the coast, in both moist and dry regions; common. Fl. Jan.–March; white.
Throughout the Tropics.

2. **C. capillaris,** *Meissn. in DC. Prod.* xv. 1, 252 (1864).
C. P. 3982.
Fl. B. Ind. v. 188.

Stems very slender, thread-like, twining, branched, twisted and matted together, glabrous, pale green; fl. few, sessile, in small shortly peduncled heads; per.-segm. ovate, obtuse; fruit about $\frac{1}{6}$ in., oblong-ovoid, bluntly 6-angled.

Moist low country, very rare. Between Kalutara and Aggalawatte (Thwaites). Fl. June; white.
Also in Borneo.

10. **HERNANDIA,** *L.*

Tree, l. alt., fl. unisexual, monœcious, in panicles, fem. with a cupular calyx-like involucel at base which becomes

greatly enlarged and thickened in fruit; per.-tube adnate to ov., segm. 3–6 in male, 4–8 in fem., in 2 valvate rows; stam. 3, opp. outer per.-segm., fil. usually with 2 glands, anth. 2-celled, opening at the edge; staminodes (in fem. fl.) 4, globose, ov. inferior, style short, stigma dilated, lobed; fruit enclosed (except the top) by the enlarged thick fleshy involucel, pericarp thin; seed globose, testa hard, ribbed, cotyledons large, fleshy, much lobed.—Sp. 8; 1 in *Fl. B. Ind.*

H. peltata, *Meissn. in DC. Prod.* xv. 1, 263 (1864). **Palatu,** *S.*
Burm. Thes. 171. Fl. Zeyl. n. 423. *H. Sonora*, L., Moon Cat. 62; Thw. Enum. 258. C. P. 2914.

Fl. B. Ind. v. 188. Wight, Ic. t. 1855. Bedd. Fl. Sylv. t. 300 (dissections by Thwaites). Seem. Fl. Viti. t. 52.

A large tree with wide-spreading head, branchlets stout, young parts pilose; l. large, 4–6 in., broadly ovate, peltate, obtuse or acute, entire, glabrous, palmately veined, petiole as long as l.; fl. pedicellate, in threes (the central one fem. the lat. ones male), surrounded by an involucre of 4 oval pubescent bracts, at ends of long divaricate branches of lax spreading axillary panicles; perianth finely tomentose, segm. oblong-oval, obtuse; fil. short; fruit nearly 1 in., ovoid, very blunt, lobed and umbilicate on top, 8-ribbed.

Seacoast of the moist region from Colombo to Matara; rather rare. Fl. Nov.

Also at Andaman Is., Singapore, Malay and Pacific Is., N. Australia, Madagascar, E. Africa, but not in Peninsular India.

There is no specimen in Herm. Herb., but a good drawing. The name *H. Sonora*, L., is now restricted to the American species, to which it chiefly referred, but the two are scarcely separable.

CXIV.—PROTEACEÆ.

Trees, l. alt., without stip., fl. regular, bisexual, in axillary racemes; perianth-leaves 4, at first coherent but soon separating to base, valvate, linear; stam. 4, inserted on upper part of per.-leaves, anth. 2-celled with prolonged connective; ov. small, superior, with 2 lateral or basal ascending ovules, style very long, stigma clavate; fruit dry, indehiscent, ovoid; seed solitary (rarely 2), embryo with large plano-convex cotyledons, endosperm o.

A large family nearly confined to Australia and the Cape. *Helicia* is the only Trop. Asiatic genus.

HELICIA, *Lour.*

For characters, see Order.—Sp. 25 ; 10 in *Fl. B. Ind.*

H. zeylanica, *Gardn. in Calc. Journ. Nat. Hist.* vii. 453 (1846). [PLATE LXXIX.]
Meissn. in DC. Prod. xiv. 438. Thw. Enum. 250. C. P. 690.
Fl. B. Ind. v. 190.

A small tree about 20 ft., bark dark grey, smooth, young parts glabrous; l. 2–4 in., oval or obovate-oval, acute at base, obtuse or rounded, entire or distantly denticulate-serrate, glabrous, petiole stout; fl. numerous, moderate-sized, on horizontal ped., in stiff divaricate racemes, 3–4 in. long from axils of fallen l., bracts inconspicuous; perianth $\frac{3}{4}$–1 in., club-shaped in bud, segm. linear, acute, recurved; fil. 0, anth. linear-oblong; style much exserted; fruit under 1 in., broadly ovoid, acuminate, purplish-black, 1- (rarely 2-) seeded, testa with the upper half much thickened (indenting the embryo to an equal extent), rugose.

Moist region, 2–4000 ft.; rather rare. Near Navalapitiya (Gardner); Dolosbagie; Galagama; Rangala. Fl. Feb.–April, September; creamy yellow, the infl. dark purple.

Endemic.

The leaves are sometimes sharply denticulate, and I suspect that *H. nilagirica*, Bedd., will prove to be specifically the same.

Grevillea robusta, A. Cunn., a native of Queensland and N. S. Wales, has been very largely planted as a shade and fuel tree, especially on tea estates. It was introduced in 1856, and is found to thrive at all elevations, seeding freely.

CXV.—THYMELÆACEÆ.

SHRUBS or trees, l. opp. or alt., entire, without stip., fl. small, regular, bisexual, in clusters, heads or racemes; perianth tubular, often with a ring of scales or hair at mouth, segm. 4 or 5, imbricate; stam. 5 in 1 row or 8 or 10 in 2 rows, inserted at mouth of per.; ov. 1- or 2-celled, with a single pendulous ovule in each cell; fruit dry (fleshy in *Phaleria*), indehiscent (2-valved in *Gyrinops*); seed lateral or pendulous, embryo straight with or without endosperm.

Fruit indehiscent.
Ov. 1-celled; fruit dry.
Fl. 4-merous . . . . . . 1. WIKSTROEMIA.
Fl. 5-merous . . . . . . 2. LASIOSIPHON.
Ov. 2-celled; fruit fleshy . . . 3. PHALERIA.
Fruit a 2-valved capsule (*Aquilarieæ*) . 4. GYRINOPS.

1. WIKSTROEMIA, *Endl.*

Shrub, l. opp. (rarely alt.), entire, fl. small, in axillary racemes; perianth tubular, lobes 4, short, without scales in mouth; stam. 8 in 2 rows, inserted in upper part of tube; ov. surrounded by a disk composed of a few linear processes, 1-celled with a single suspended ovule, style 0, stigma globose; fruit a dry drupe, included in persistent base of perianth, indehiscent, 1-seeded, stone crustaceous.—Sp. 20; 2 in *Fl. B. Ind.*

W. canescens, *Meissn. in Denkschr. Regensb. Bot. Ges.* iii. 288. (1841).

Daphne inamœna, Gardn. in Calc. Journ. Nat. Hist. vii. 454. *W. inamœna*, Meissn. in DC. Prod. xiv. 547. *W. virgata*, Meissn., Thw. Enum. 250. C. P. 2206.

Fl. B. Ind. v. 195. Bedd. For. Manual, t. 25, f. 4.

A small shrub, 1–3 ft., with slender erect branches, bark reddish-brown, smooth; l. numerous, on very short petioles, $1\frac{1}{4}$–2 in., oblong or obovate-oblong, acute at base, rounded but sometimes apiculate at apex, glabrous, somewhat glaucous beneath, lat. veins numerous, inconspicuous; fl. articulated on short silky ped., in short, stalked, slender, drooping axillary racemes, no bracts; perianth about $\frac{1}{4}$ in., pubescent, segm. oval, obtuse, spreading, fil. very short; ov. hairy, very shortly stalked.

Upper montane zone. Nuwara Eliya; Pedurutalagala; Horton Plains; also near Peradeniya, but, no doubt, escaped from Bot. Gardens. Fl. April, &c.; pale yellow.

Also in E. Himalaya, N. China, Affghanistan. Not in Indian Peninsula.

The inner bark gives a tough fibre.

2. LASIOSIPHON, *Fresen.*

Small bush, l. alt., fl. in terminal bracteated heads; perianth with a long narrow tube; limb with 5 spreading segm. and, alternating with them at the mouth, 5 small scales (? pet.); stam. 10 in 2 rows inserted in top of tube; ov. superior, with a single pendulous ovule, style long, stigma

globose; fruit small, dry, included in perianth-tube.—Sp. about 25; 1 in *Fl. B. Ind.*

L. eriocephalus, *Decne. in Jacquem. Voy. Bot.* 148 (1844).
Naha, *S.*

Gnidia eriocephala, Gardn. in Calc. Journ. Nat. Hist. vii. 456. Meissn. l. c. 597. Thw. Enum. 250. C. P. 469.
Fl. B. Ind. v. 197. Wight, Ic. t. 1859.

A much-branched bush, 6–10 ft., twigs slender, erect, glabrous; l. 2–3 in., linear- or lanceolate-oblong, acute at base, acute or obtuse, apiculate, entire, glabrous, thin, petiole very short; fl. nearly sessile, in erect, dense, terminal heads, 1–1½ in. wide, surrounded at base by an involucre of large imbricate, oval, acute, silky bracts; per.-tube ⅜ in., silky-pubescent outside and with long white hair at lower part, segm. oblong, obtuse, flat, scales ovate, obtuse; anth. almost sessile, included.

Var. β, **zeylanicus,** *Meissn.* l. c. 598. *Gnidia insularis*, Gardn. l. c. 456. *Lasiosiphon insularis*, Meissn. l. c. 598. C. P. 2913.

L. and branches more or less silky-villous.

Open rocky places, 2000–4000 ft.; rather common, especially in Uva Prov. Var. β, Hantane, Palagama, &c. Fl. most of the year; bright yellow.

Also in S. India.

The bark affords a good fibre; it is also employed as a fish-poison, and used in medicine externally.

3. PHALERIA, *Jack.*

Small tree, l. large, opp., fl. in nearly sessile heads on the old wood, with an involucre of deciduous bracts; per.-tube long, segm. 4, short, scales 0; stam. 8, in 2 rows, inserted at mouth of tube, slightly exserted; ov. superior, 2-celled, with 1 pendulous ovule in each, style long, stigma capitate; fruit a drupe, with copious fleshy pulp and a thin crustaceous stone, 1- or 2-seeded.—Sp. 8; 1 in *Fl. B. Ind.*

P. cauliflora, *Bedd. Forest. Man.* 180 (1873?).
Drymispermum cauliflorum, Thw. Enum. 251. C. P. 3459.
Fl. B. Ind. v. 199. Bedd. For. Man. t. 25, f. 3.

A small graceful tree with long slightly pendulous branches, young parts glabrous; l. large, 6–9 in., oblong-lanceolate, acute at base, caudate-acuminate, acute, entire, glabrous and shining, petiole very short; fl. sessile, bracts small, ovate, subacute, glabrous; per.-tube ½ in., glabrous, segm. rotundate, concave; drupe over 1 in., ovoid, slightly pointed, fleshy, crimson.

Moist low country below 1000 ft., very rare. I have seen only the C. P. specimens collected by Thw. by a stream at Hewesse, Pasdun Korale, in 1855, in fl. and fruit. Fl. May; pure white.

Endemic.

4. **GYRINOPS,** *Gaertn.*

Tree, l. alt., entire, fl. few in axillary umbellate clusters; perianth tubular, with a ring of short hairs and scales above stam., segm. 5, short; stam. 5 in 1 row, inserted in mouth of tube opp. segm.; ov. on a rather long stalk, 2-celled, with a pendulous ovule in each cell, style long, stigma capitate; fruit a coriaceous capsule, dehiscing loculicidally into 2 valves; seeds ovoid, pointed, produced into a long tail-like process at base.—Sp. 2; 1 in *Fl. B. Ind.*

G. Walla, *Gaertn. Fruct.* ii. 276 (1791). **Wallá, Paṭṭa-wallá,** *S.*
Cameraria zeylanica, Moon Cat. 20 (non Retz.). Thw. Enum. 251. C. P. 1828.

Fl. B. Ind. v. 199. Hook, Ic. Pl. t. 5. Wight, Ic. t. 1850. Bedd. Fl. Sylv. t. 303.

A small tree with slender erect trunk and a small rounded head, branchlets numerous, slender, erect, bark thin, smooth, reddish-brown, buds silky; l. on very short petioles, $2\frac{1}{2}$–4 in., oblong-lanceolate, acute at base, shortly acuminate, obtuse or subacute, entire, with a very narrow hyaline edge, quite glabrous, slightly shining, lat. veins very fine and numerous, midrib prominent beneath; fl. small, on short slender pubescent ped., 3–5 in shortly stalked umbels from axils of present or fallen l., bracts small, hairy, caducous; perianth barely $\frac{1}{2}$ in., slender, pubescent, segm. oval, subacute, spreading, anth. sessile; capsule $\frac{3}{4}$ in., obovate, compressed, pointed, coriaceous, reddish-brown; seeds covered with brown hair.

Moist region, up to 4000 ft.; rather common. Fl. Dec.; yellowish-white.

Endemic.

Specimens from Kœnig are in Herb. Mus. Brit. The fruits described and figured by Gaertner from the Leyden Museum were, doubtless, collected by Hermann, but the name is not given in his 'Mus. Zeyl.' The leaves, which are a bright apple-green, dry orange-brown. The bark gives a very tough fibre, from which strong ropes are made.

CXVI.—ELÆAGNACEÆ.

LARGE usually scandent shrubs, l. alt., entire, without stip., scaly beneath, fl. small, regular, bisexual, in axillary clusters; perianth scaly, tube narrow below, globose above, segm. 4, valvate; stam. 4 inserted at mouth of per.; ov. superior, 1-celled with a solitary erect basal ovule, style rather long, stigma lateral; fruit enclosed in the persistent thickened base of per.-tube, indehiscent, seed without endosperm, embryo straight, with thick cotyledons.

ELÆAGNUS, *L.*

For characters, see Order.—Sp. 12; 4 in *Fl. B. Ind.*

E. latifolia, *L. Sp. Pl.* 121 (1753). **Wel-embilla, Katu-embilla,** *S.*

Herm. Mus. 8. Burm. Thes. 92. Fl. Zeyl. n. 58. Moon Cat. 11. Thw. Enum. 252. C. P. 83, 2263, 2264.

Fl. B. Ind. v. 202. Burm. Thes. t. 39. Wight, Ic. t. 1856. Bedd. For. Man. t. 25, f. 1.

A shrub or small tree, usually more or less scandent by the horizontal often spinescent branches, bark whitish-brown, scaly when young; l. numerous, very variable, $1\frac{1}{2}$–$4\frac{1}{2}$ in., broadly or narrowly oval, acute at base, obtuse or rounded at apex, entire, often undulate, thin, glabrous above, densely covered beneath with a shining coat of minute, peltate, silvery or rusty scales, petiole $\frac{1}{4}$–$\frac{1}{2}$ in., scaly; fl. on short scaly ped., 2–5 in axillary clusters; perianth over $\frac{1}{4}$ in., fleshy, densely covered with scales, lobes ovate, acute, spreading, fil. short, style stout; fruit nearly 1 in., ovoid-oblong, with 8 strong blunt ribs, capped with persistent per.-limb, scaly, pinkish-red, fleshy; seed $\frac{3}{4}$ in., linear-oblong, pointed, ribbed.

Var. β, **Thwaitesii.** *E. Thwaitesii*, Schlecht. in DC. Prod. xi. 611. C. P. 2724, 83 (part).

L. broader, rounded at base, more acute, thicker, scales all ferrugineous.

Moist and intermediate region from sea-level to highest elevations; common. Var. β, only in montane zone. Fl. Oct.-Feb.; white, greenish or pale yellow, sweet-scented.

India, Burma, Malaya, China.

A remarkably variable plant in habit and foliage. When a climber, it is often very thorny. The leaves are often mottled above with purplish-brown stains.

CXVII.—LORANTHACEÆ.

SHRUBS parasitic on branches of other trees, stems much branched, often jointed, l. opp. or alt., entire, without stip., or 0, fl. large or small, bisexual or unisexual, axillary, in racemes or clusters rarely solitary, usually bracteate, *dichlamydeous ;* cal.-tube adnate to ov., limb short, truncate or 4–5-toothed or absent ; pet. (often called per.-segm.) 3–5, distinct or connate, valvate ; stam. 3–5, opp. pet. and sometimes adnate to them ; ov. inferior, 1-celled, with 1 erect ovule very obscure and adnate to walls of ov. ; fruit fleshy or pulpy ; seed solitary, embryo straight in fleshy endosperm.

The presence of petals has caused this family to be sometimes placed near *Cornaceæ* and *Araliaceæ*.

Fl. bisexual, conspicuous . . . . . 1. LORANTHUS.
Fl. unisexual, inconspicuous.
  Anth. adnate to pet. . . . . . 2. VISCUM.
  Anth. not adnate to pet.
    Anth. many-celled . . . . . 3. NOTOTHIXOS.
    Anth. 2-celled . . . . . . 4. GINALLOA.

Of our 25 species, 6—5 species of *Loranthus* and *Notothixos* are restricted to the moist low country; 3 species—*L. scurrula*, *L. ligulatus*, and *Viscum articulatum*—to the dry region; and 7—4 species of *Loranthus* and 3 of *Viscum* to the montane zone. The remainder are more generally, but capriciously, distributed, and appear to be somewhat independent of climatic conditions. As many as 10 species—8 of *Loranthus*, *Notothixos*, and *Ginalloa*—are endemic. All are called *Pilila*, S., and *Kuruvichchai*, T.

1. LORANTHUS, *L.*

Branching shrubs, parasitic on the branches of trees, l. alt. or opp., fl. bisexual, in axillary clusters or racemes, each with a bract and sometimes 2 bractlets at base ; cal.-tube adnate to ov., limb truncate or 4- or 5-toothed or absent ; cor. more or less tubular, often split down one side, lobes (often separate pet.) 4 or 5, valvate, elastically separating and usually strongly reflexed ; stam. 4 or 5, inserted opp. the lobes ; ov. inferior, style long ; fruit a berry, seed solitary.—Sp. 350 ; 58 in *Fl. B. Ind.*

Fl. without a pair of bractlets within the bract.
  Pet. 4, distinct (*Baratranthus*).
    L. over 3 in. ; pet. $\frac{1}{2}$ in. . . . . . 1. L. NODIFLORUS.
    L. under 1 in. ; pet. $\frac{1}{4}$ in. . . . . . 2. L. MABÆOIDES.

Cor. 4- or 5-lobed.
  Bracts small, not forming an involucre.
    Cor.-tube under ¾ in. (see also 14); lobes 4.
      Cal.-limb obvious, short (*Phœnicanthemum*).
        L. opp.; fl. on ped. . . . . 3. L. ENSIFOLIUS.
        L. alt.; fl. sessile . . . . . 4. L. HOOKERIANUS.
      Cal.-limb absent; fruit clavate (*Cichlanthus*).
        L. oval, not cordate at base . . 5. L. SCURRULA.
        L. rotundate, cordate at base. . 6. L. CORDIFOLIUS.
    Cor.-tube over ¾ in. (except 14), often split, lobes 5 (*Dendrophthoe*).
      Cal.-limb obviously toothed.
        Fl. in clusters . . . . . 7. L. TOMENTOSUS.
        Fl. in racemes.
          L. spathulate-oval . . . . 9. L. SCLEROPHYLLUS.
          L. rotundate . . . . . 11. L. SUBORBICULARIS.
      Cal.-limb truncate, or very nearly so.
        Cor.-tube under 1 in.
          L. alt.; cor.-tube over ½ in. . 8. L. CUNEATUS.
          L. opp.; cor.-tube under ½ in. 14. L. NEELGHERRENSIS.
        Cor.-tube over 1 in.
          Fl. in racemes.
            L. under 3 in. . . . . 10. L. LIGULATUS.
            L. over 4 in. . . . . 12. L. LONGIFOLIUS.
          Fl. in fascicles . . . . 13. L. LONCHIPHYLLUS.
  Bracts large, forming an involucre to infl. (*Tolypanthus*) . . . . . . 15. L. GARDNERI.
Fl. with a pair of bractlets within the bract (*Elytranthe*).
  Cor.-tube over 1 in. . . . . . . 16. L. LONICEROIDES.
  Cor.-tube under ½ in. . . . . . . 17. L. CAPITELLATUS.

1. **L. nodiflorus,** *Thw. Enum.* 134 (159).
C. P. 2589.
Fl. B. Ind. v. 204.

Branches rather slender, compressed, young ones sharply 2-angled, young parts furfuraceous; l. alt., 2-3½ in., ovate-lanceolate, acute at base, somewhat acuminate, obtuse, coriaceous, bright green, veins inconspicuous, petiole short, stout; fl. sessile, small, crowded in sessile axillary clusters, bract nearly as long as cal., furfuraceous; cal.-tube globose, rusty-pubescent, limb short, nearly truncate; pet. 4, distinct, about ½ in., linear, acute, upper half reflexed, stam. included; fruit not seen.

Damp forests in moist low country. Hiniduma; Ambagamuwa. Fl. March; crimson.
Endemic.

2. **L. mabæoides,** *Trim. in Journ. Bot.* xxvii. 166 (1889).

Twiggy, much branched, bark rough, young parts densely furfuraceous, l. numerous, alt., small, ½–1 in., ovate, rounded at base, obtuse, stiff not fleshy, veins (except midrib) obscure, petiole very short; fl. very small, sessile, 2–4 in small fascicles in axils of past and present l., bracts large, shallowly cup-shaped, pubescent, faintly ciliate; cal. pubescent, limb short, cup-shaped, truncate, faintly 4-toothed; pet. 4, distinct, under ¼ in., linear, obtuse, straight; stigma capitate; fruit not seen.

Montane zone; very rare. Kalupahane Valley; Lagalla; East Matale. Fl. September.

Endemic.

My specimens of this distinct species are not very good.

3. **L. ensifolius,** *Thw. Enum.* 134 (1859).
C. P. 3453.
Fl. B. Ind. v. 206.

Stems cylindrical, slightly branched, dark blackish-grey, smooth, young parts glabrous; l. opp., 2½–4 in., oblong-falcate, acute at base, slightly acuminate, very obtuse, rather coriaceous, with 3 or 5 parallel veins, pale glaucous green, vinous-purple beneath when young; fl. on longish spreading ped., numerous, secund, in opp. axillary glabrous racemes about 2 in. long, bracts short, triangular; cal. glabrous, limb very short, truncate; cor.-tube ½ in., very slender; fruit not seen.

Moist low country below 1000 ft.; very rare. Karawita Kande, south of Ratnapura. First found by Thwaites in 1855. Fl. April; purplish.

Endemic.

I have collected this only in bud.

4. **L. Hookerianus,** *W. & A. Prod.* 381 (1834).
Thw. Enum. 134. C. P. 1645.
Fl. B. Ind. v. 207.

Stems stout, much branched, bark dark-brown, smooth, twigs rufous-pubescent or mealy, l. sub-opp. or alt., 2½–3½ in., oval, acute or obtuse at base, obtuse at apex, rufous-scurfy when young, afterwards glabrous and shining, coriaceous, usually very undulate and twisted, petiole short; fl. small, ⅜ in., sessile, numerous but not crowded in erect axillary spikes 1½–3 in. long, rachis stout, densely rusty-pubescent, bracts ovate, subacute, as long as cal.-tube, buds straight, clavate; limb of cal. obvious, very short, toothed; cor.-lobes (distinct pet.) 4, linear, obtuse, strongly bent and reflexed or spreading; stam. 4; style persistent, stigma globose; ripe fruit not seen.

Up to 6000 ft.; rare. Batticaloa (Gardner); Uva; Maturata; Hantane; Hakgala. Fl. March, July, September; crimson-scarlet.

Also in S. India.

5. **L. Scurrula,** *L. Sp. Pl.* ed. 2, 472 (1762).
L. buddleoides, Desr., Thw. Enum. 136 (part). C. P. 2391 (part).
Fl. B. Ind. v. 208. Roxb. Cor. Pl. t. 140.

Much branched, stems cylindrical, lenticellate, pubescent, young parts rusty-tomentose; l. opp., $1\frac{1}{2}$–2 in., oval or sub-rotundate, acute or rounded at base, obtuse, glabrous or nearly so above, more or less rusty-pubescent beneath, penni-nerved, petiole short; fl. on short slender ped., in very short pubescent axillary racemes (often 2 or 3 from one axil), bracts small, tomentose, buds clavate; cal. tomentose, tube long, limb almost absent; cor.-tube very slender in bud, afterwards slightly inflated, about $\frac{1}{3}$ in., curved, pubescent, lobes 4, short, linear, reflexed; stam. exserted, fruit under $\frac{1}{2}$ in., clavate-pyriform, whitish.

Low country in dry and intermediate districts. Batticaloa; Anuradhapura; Kekirawa; between Badulla and Haputale. Fl. March–July; greenish-yellow, stam. crimson.

Throughout India.

6. **L. cordifolius,** *Wall. in Roxb. Fl. Ind.* (ed. Carey & Wall.), ii. 223 (1824).
L. buddleoides, Thw. Enum. (part). C. P. 2391 (part).
Fl. B. Ind. v. 209.

Whole plant more or less densely covered with white or tawny scurfy tomentum; l. $1\frac{1}{2}$–$2\frac{1}{2}$ in., rotundate or very broadly oval, cordate at base, rounded at apex; fl. as in *L. Scurrula*, but larger and white-tomentose outside; fruit as in the last but tomentose.

Chiefly in dry region, but also in lower montane zone, up to 4000 ft., rare. Haragama; Anemaduwe, N.W. Prov.; Galagama. Fl. February; August.

Also in India.

Scarcely more than a variety of *L. Scurrula*.

7. **L. tomentosus,** *Heyne in Roth Nov. Sp.* 191 (1821).
L. tomentosus, var. *lanuginosus*, Thw. Enum. 135. C. P. 2492.
Fl. B. Ind. v. 212.

Stems slender, bark dark brown, warted, shining when old, the young twigs covered with dense ferrugineous tomentum, buds very tomentose; l. alt., $1\frac{1}{2}$–2 in., broadly oval, abruptly acute at base, when mature glabrous shining and bright green above, densely rufous-tomentose beneath, rather thick, venation prominent beneath, depressed above, petiole rather short; fl. on short stout tomentose ped., 2–6 in shortly stalked or sessile axillary clusters, bracts ovate, acute, usually longer than cal., buds clavate, curved; cal.-limb 5-toothed, shaggy-tomentose; cor. about $\frac{3}{4}$ in., tube

laterally compressed, split half way down on one side, densely woolly outside, lobes 5, short, linear, obtuse, strongly recurved; fruit not seen.

Var. β, **incanus,** *Trim.* *L. incanus*, Moon Cat. 26. *L. tomentosus*, var. *normalis*, Thw. Enum. 135. C. P. 1642.

Less tomentose, l. often rotundate, bracts shorter than cal., deciduous; cal. pubescent not shaggy; cor. rather longer and narrower, densely pubescent but not woolly outside.

Low country, and up to 5000 ft.; rather rare. Uva and Maturata (Thwaites); Bintenne. Var. β, moist region, extending up to 7000 ft.; rather common. Kalutara (Moon); Peradeniya; Ramboda; Hakgala; Horton Plains. Fl. February, July, November; pinkish or yellowish-green, fil. crimson.

Also in S. India.

Dries brownish-orange. There are intermediates connecting var. β with the type.

8. **L. cuneatus,** *Heyne in Roth Nov. Sp.* 193 (1821).
Thw. Enum. 135. C. P. 2554, 1641.
Fl. B. Ind. v. 214.

Branches long, slender, numerous, bark silvery-grey, lenticellate, l. small, 1–1½ in., alt. (often in fascicles of 2 or 3), subsessile or on very short petioles, cuneate-obovate, acute at base, rounded, glabrous, midrib breaking up into branches before reaching end of l.; fl. on short glabrous ped., 1–4 in clusters from axils of past and present l., bracts half as long as cal., broad, subacute; cal. nearly glabrous, limb shortly and irregularly toothed; cor.-tube ⅝ in., slender, slightly gibbous at base, split to base down the back, lobes 5, linear, ¼ in., acute, recurved; stam. 5, erect, anth. very narrow; fruit ½ in., oblong, crimson.

Low country in both regions; common. Fl. all the year; pale green, stam. red.

Also in S. India.

Very destructive to fruit trees in Peradeniya Gardens. C. P. 1641 is var. γ of Thwaites, and differs in its narrower leaves and longer flowers on hoary-tomentose pedicels. It is confined to the dry region.

9. **L. sclerophyllus,** *Thw. Enum.* 135 (1859).
C. P. 2442.
Fl. B. Ind. v. 214.

Much branched, bark cracked, brownish-grey, young parts very slightly fulvous-pubescent; l. alt., ¾–3 in., spathulate-oval, much tapering to base, rounded at apex, glabrous, very coriaceous and stiff, more or less distinctly 3-nerved, midrib and margin often red, petiole short, obscure; fl. on short

slender ped., 2–5 in small axillary racemes, bracts shorter than ov.; cal. pubescent, limb 5-toothed; cor. $\frac{3}{4}$–1 in., tube slightly inflated, split a short way down one side, lobes 5, linear, acute, reflexed; fruit oblong (not seen ripe).

Montane zone up to 7000 ft. or more. Abundant on *Rhododendron* about Nuwara Eliya; Elk Plains; Pedurutalagala; Deltota; Haputale. Fl. May–July; bright orange-pink.
Endemic.

Very variable in the size of the leaves. Dries black. There is a specimen in Herb. Perad. labelled 'Batticaloa,' which locality may be an error. Specimens past flower with extremely coriaceous leaves collected at Kalupahane, Lagalla, on coffee, may be this or an allied species.

10. **L. ligulatus,** *Thw. Enum.* 135 (1859).
C. P. 1640.
Fl. B. Ind. v. 214.

Slightly branched, slender, bark silvery-grey; l. alt. or sub-opp., 2–3 in., oblong-linear or oblong, acute at base, very obtuse, very fleshy, veins obscure, pale glaucous-green, petiole short, stout; fl. on slender glabrous ped., on shortly stalked racemes mostly from axils of fallen l., bracts ovate, obtuse, not half as long as ov., cal.-limb truncate, minutely 5-toothed, glabrous; cor.-tube 1 in., glabrous, nearly straight, lobes 5, linear, $\frac{1}{2}$ in., acute, spreading; fruit (not ripe) oblong, capped with cal.-limb.

Dry or desert region; rare. Jaffna; Mannar; Kalpitiya. Generally on *Salvadora* trees. Fl. January, February; tube lemon-yellow, segm. green.
Endemic.

11. **L. suborbicularis,** *Thw. Enum.* 134 (1859).
C. P. 474.
Fl. B. Ind. v. 214.

Branches rather stout, bark greyish-brown, rough, young parts finely fulvous-tomentose; l. alt., 1–2 in. (rarely more), rotundate or very broadly oval, slightly tapering at base, rounded or very obtuse at apex, glabrous, very coriaceous, 3-nerved at base, petiole $\frac{1}{4}$ in., fl. on short ped., numerous, in shortly stalked pubescent erect or spreading racemes, bracts ovate, acute, more than half as long as ov.; cal.-segm. short, acute, hairy; cor.-tube $\frac{3}{4}$ in., nearly straight, slightly inflated, pubescent outside, slightly split, lobes 5, linear, recurved; fruit $\frac{1}{3}$ in., ovate-oblong, capped with cal.-segm., bright crimson.

Montane zone, 4000–7000 ft. Hantane; Galagama; Pedurutalagala; Horton Plains. Often on *Rhododendron*. Fl. April–June; tube greenish-yellow, segm. pale orange, anth. purple.
Endemic.

12. **L. longiflorus,** *Desrouss. in Encycl. Meth.* iii. 598 (1789).
Moon Cat. 26. Thw. Enum. 134. C. P. 198.
Fl. B. Ind. v. 214. Wight, Ic. t. 302.

Large, much branched, bark grey, smooth, young parts glabrous; l. large, alt. or opp., 4–7 in., ovate- oval- or linear-oblong, rounded at base, very obtuse, undulate and twisted, glabrous, leathery, midrib very prominent, purple beneath, petiole very short; fl. on very short ped., in short spreading stout curved axillary racemes often 2 from one axil, bracts very short, obtuse; cal. puberulous, limb entire, truncate, cor.-tube 1–1¼ in., curved, slightly widened upwards, lobes ½ in., linear, reflexed, fil. as long as anth., pubescent, fruit rather over ½ in., oval-ovoid, not crowned with cal.-limb, red.

Var. β, **amplexifolius,** *Thw. l. c.* C. P. 2414.

L. quite sessile, 5–8 in., cordate at base, broadly oblong-oval, very coriaceous, veins often purple beneath; cor.-tube 2 in., much curved, upper half more inflated.

Low country in both moist and dry regions, var. β extending up to 7000 ft.; common. Fl. March, September, December; tube pink or pale orange, lobes green, fil. orange.

Also in India and Malay Peninsula.

I have never seen purple fl. as described by Wight for his *L. amplexifolius*.

Very variable in size, colour of fl., and shape of leaves. *L. falcatus*, L. f., seems the oldest name for this species.

13. **L. lonchiphyllus,** *Thw. Enum.* 418 (1864).
C. P. 3678.
Fl. B. Ind. v. 215.

Branches stout, cylindrical, with large l.-scars, bark white smooth, young parts glabrous, l. alt. and sub-opp., 4–6 in., ovate, rounded at base, acuminate, subacute, glabrous, stiffly coriaceous, bullate, penninerved, the veins strong and very prominent beneath and depressed above, petiole very short; fl. on short glabrous ped., in shortly stalked clusters, bracts very short; cal.-limb truncate; cor.-tube 1¼ in., slightly curved, inflated above the middle, split about half way down, lobes linear, reflexed; fruit ⅓ in., ovoid, blunt, red.

Low moist region; very rare. The C. P. specimens are from Ambagamuwa, 1860 (Thwaites), and are in bud only. Fl. November; buds crimson with purple tips.

Endemic.

14. **L. neelgherrensis,** *W. & A. Prod.* 382 (1834).
Thw. Enum. 134. C. P. 1647.
Fl. B. Ind. v. 216. Wight, Ic. t. 1020.

Branches stout, thickened at nodes, bark grey, cracked, not lenticellate; l. large, opp., nearly sessile, 3½–6 in., oval or oblong-lanceolate, tapering to base, obtuse, undulate, glabrous, coriaceous, pale green, veins obscure; fl. on very short ped., 4–10 in shortly stalked umbellate racemes, several of which come from one axil or node, bracts very short; cal. glabrous, limb very short, truncate; cor.-tube ⅜ in., straight, not split, slightly inflated, glabrous, lobes as long as tube, upper half recurved; fruit about ½ in., ovoid-pyriform, orange.

Moist region up to 7000 ft.; common. Fl. nearly all the year; tube orange-pink, lobes pale green, or all red.

Also in S. India.

The cor.-lobes separate first from the base, the upper halves remaining connate, and finally splitting apart and folding back suddenly and explosively.

15. **L. Gardneri,** *Thw. Enum.* 133 (1859).
C. P. 1644.
Fl. B. Ind. v. 218.

Branches long, cylindrical, stout, swollen at nodes, bark silvery-grey, twigs shining, purple, young parts glabrous; l. large 3½–6 in., oblong-oval or lanceolate, acute or slightly rounded at base, acuminate, coriaceous, penninerved, pale green above, nearly white with purple prominent midrib beneath, bright pink when young; fl. sessile, in clusters of 5 or 6 on the old wood, bracts forming a whorl or involucre round the cluster, ½ in., lanceolate, attenuate, finely pilose, red; cal.-limb nearly truncate; cor.-tube 1–1¼ in., slightly curved, dilated in upper half, not split, slightly pilose, lobes less than half as long as tube, very narrowly linear, acute, spreading or recurved; anth. exserted; stigma globose; fruit about ½ in., oblong-ovoid, red.

Moist low country up to 3000 ft.; very rare. Hantane; Deltota; Mandagala Forest, Hewesse; Ambagamuwa. Fl. March–May; dark pink, the base of the lobes green.

Endemic.

A very handsome plant when growing.

16. **L. loniceroides,** *L. Sp. Pl.* ed. 2, 473 (1762).
Herm. Mus. 20. Fl. Zeyl. n. 83 (err. typog. *Lonicera*). Thw. Enum. 133. C. P. 575, 2551.
Fl. B. Ind. v. 221. Wight, Ic. t. 303.

Bushy, much branched, stems stout, thickened at the nodes, bark brownish-grey, smooth; l. opp., 3–4 in., oblong-oval, rounded and suddenly narrowed at base, acuminate, obtuse, somewhat erose on margins, coriaceous, shining, more or less conduplicate, midrib much recurved; fl. rather large,

sessile, in three decussate pairs in short axillary spikes, bracts much shorter than ov., ovate, acute, bractlets 2, rounded; cal.-limb tubular, slightly and irregularly toothed; cor.-tube 1¼ in., widened above, slightly curved, lobes about ½ in., acute, recurved; stam. 6; stigma globose; fruit small, under ½ in., ovate-ovoid.

Montane zone, 3000–7000 ft.; rather rare. Passara, Uva; Maturata; Nuwara Eliya; Hakgala. Fl. January, September; tube pink, lobes green tipped with dark pink, anth. orange, fil. green.

Also in S. India.

Moon gives Colombo as a locality, and, as it was also collected by Hermann, this is probably correct. The Maturata specimens (C. P. 2551) have smaller and very obtuse l. and much smaller fl., which are entirely crimson, except at the base of the lobes. I have collected this variety also at Hakgala in fruit, which is nearly globose crowned with the long cal.-tube and inky-black; it is possibly a separate species.

17. **L. capitellatus,** *W. & A. Prod.* 382 (1834).
Thw. Enum. 133. C. P. 2814, 3716.
Fl. B. Ind. v. 221. Wight, Ic. t. 304.

Branches slender, thickened at nodes, usually compressed when young, bark pale brown, smooth, young parts glabrous; l. 2½–5 in., opp., ovate or ovate-lanceolate, rounded at base, acuminate, acute, glabrous, rather coriaceous, midrib usually purple; fl. sessile, in shortly pedunculate clusters of 3 or 4 in leaf-axils; bracts and bractlets much shorter than ov., rounded, glabrous; cal.-limb long, nearly truncate; cor.-tube short, ¼–⅓ in., inflated or widely funnel-shaped, lobes usually longer than tube, oblong-linear, obtuse, recurved; fruit ⅓ in., globose, capped with long cal.-limb, black, shining.

Moist low country up to 2000 ft.; rather rare. Kandy (Moon); Ratnapura; Matugama, Pasdun Korale; Mapalagama, S. Prov. Fl. March–May; tube yellow, lobes pink or green, tipped with dark pink.

Also in S. India.

2. VISCUM, *L.*

Small, much-branched, jointed shrubs, parasitic on branches of trees, l. opp. or 0, fl. very small, unisexual, usually monœcious, axillary, solitary or clustered; cal.-tube adnate to ov., limb usually obsolete or reduced to a narrow ring; pet. (often called per.-segm.) small, 3 or 4, fleshy, valvate, usually deciduous; stam. large, opp. and adnate to pet., fil. 0, anth. opening by numerous pores; ov. inferior, style very short or 0; fruit a berry; seed solitary, containing often more than one embryo. —Sp. 30; 11 in *Fl. B. Ind.*

With leaves (sometimes none in 3).
- L. oval-spathulate . . . . . . 1. V. ORIENTALE.
- L. lanceolate . . . . 2. V. MONOICUM.
- L. obovate . . . . 3. V. CAPITELLATUM.

Leafless.
- Stem slender, cylindrical . . . . 4. V. RAMOSISSIMUM.
- Stem much flattened.
  - Joints long, oblong-linear . . . 5. V. ARTICULATUM.
  - Joints short, obovate . . . . 6. V. JAPONICUM.

1. **V. orientale,** *Willd. Sp. Pl.* iv. 737 (1805).
Moon Cat. 68. Thw. Enum. 136. C. P. 412.
Fl. B. Ind. v. 224. Bl. Fl. Javæ, Loranth. tt. 24, 25.

Stems very much branched, cylindrical or angular, thickened at the nodes, twigs very slender, glabrous; l. numerous, $\frac{1}{2}$–$1\frac{1}{4}$ in., oval-spathulate, tapering to base, rounded at apex, glabrous, thick, 3- or 5-veined, petiole very short, obscure; fl. on short ped., usually in shortly pedunculate clusters of 3 at the nodes; cal.-limb quite absent; pet. usually 4, triangular, acute, deciduous; ov. oblong, much warted; fruit not seen ripe.

Throughout the island and up to 7000 ft., but especially in the dry region; rather common. Fl. January, September; green.

Also in India, Burma, Malaya, China, Australia.

Our plant seems to be *V. verruculosum*, W. & A., of S. India, which is maintained as distinct in Fl. B. Ind. Dries dark brown or black.

2. **V. monoicum,** *Roxb. Fl. Ind.* iii. 763 (1832).
Fl. B. Ind. v. 224. Griff. Ic. Pl. Asiat. t. 631.

Laxly branched, stems slender, cylindrical, slightly thickened at the nodes; l. rather distant, $1\frac{1}{2}$–$2\frac{1}{2}$ in., lanceolate, often falcately curved, tapering to both ends, acute, scarcely coriaceous, finely 3- or 5-veined, petiole very short, obscure; fl. on short ped., 4–12 in clusters, nearly sessile at the nodes, bracts truncate, apiculate, pet. 3 (or 4); fruit (not seen ripe) oblong, truncate.

Intermediate region at about 3000 ft.; rare. Ella, Uva (1890); Kiripanagala, Lagalla.

Also in Peninsular India, Khasia, and Burma.

Dries pale yellowish-brown.

3. **V. capitellatum,** *Sm. in Rees*, *Cyclop.* xxxvii. (1820).
Thw. Enum. 136. C. P. 1638.
Fl. B. Ind. v. 225.

Small, branches tufted, 6–12 in. long, rather stout, angular or somewhat compressed, pale yellowish-green, branchlets numerous, opp., short, horizontal; l. few (often not developed), $\frac{1}{2}$–$\frac{3}{4}$ in., sessile, obovate-spathulate, conduplicate, recurved, often bilobed at apex, very fleshy; fl. sessile, in threes (or pairs), very small, terminating short, stout, divaricate, compressed

opp. or whorled peduncles; cal.-limb a fleshy ring; pet. 3, triangular, subacute, fleshy, deciduous; fruit about $\frac{1}{4}$ in., oblong-ovoid, truncate, slightly rough with small prominences, pale greenish-yellow.

Low country in both regions; common. Fl. December; yellow.

Also in Peninsular India.

This is very often parasitic on *Loranthus longiflorus* and *L. neelgherrensis.* The leaves are often very few, or even quite absent. Dries black.

4. **V. ramosissimum,** *Wall. Cat.* n. 6876 (1828).
Trimen in Journ. Bot. xxvii. 166.
Fl. B. Ind. v. 225.

Stems numerous, very much branched, elongated, pendulous, very slender, nearly cylindrical, slightly swollen at nodes, yellowish; l. absent; fl. subsessile, 1–3 (usually 2) at the nodes, very small, with 3–5 small, imbricated bracts at base; fruit (? ripe) rather over $\frac{1}{4}$ in., nearly globose, apiculate, smooth, pale green.

Montane zone; very rare. Maturata at about 5000 ft.; Ragalla, Uda Pusselawe (Ferguson)?

Also in South India and (?) Singapore.

My specimens grew on *Rhododendron.* Ferguson's specimens are imperfect, but I think this species. I have seen no leaves. Wight, Ic. t. 1017 (*V. ramosissimum*) is referred in Fl. B. Ind. to *V. angulatum*, Heyne.

5. **V. articulatum,** *Burm. Fl. Ind.* 211 (1768).
V. compressum, Moon Cat. 68. *V. attenuatum*, DC., Thw. Enum. 136. C. P. 479.
Fl. B. Ind. v. 226. Griff. Ic. Pl. Asiat. t. 630 (*V. aphyllum*).

Stems 1–2 ft., pendulous, much dichotomously branched, joints very long, oblong-linear, much compressed, slightly narrowed at both ends, readily disarticulating, pale green (when dried yellowish-brown and longitudinally furrowed); l. absent; fl. very shortly pedicellate, 1–6 in fascicles at the nodes, each with a large cup-shaped bract at the base; pet. small, triangular, fruit under $\frac{1}{6}$ in., globose, smooth, greenish.

Dry and intermediate country up to 3000 ft., rather common. Jaffna; Dambulla; Trincomalie; Uma-oya; Kurunegala; Galagama; Nalande. Fl. Jan., August.

Also in India and Malaya.

Varies considerably in the width of the joints.

6. **V. japonicum,** *Thunb. in Trans. Linn. Soc.* ii. 329 (1794).
V. moniliforme, Thw. Enum. 136 (non Bl.). C. P. 295.
Fl. B. Ind. v. 226. Wight, Ic. tt. 1018, 1019 (*V. moniliforme*).

Small, not over 6 in., erect, densely branched, joints short, much flattened (lowest one or two cylindrical), obovate,

narrowed at both ends especially at base, fleshy; l. absent; fl. very small, nearly sessile, 1–6 at the nodes; pet. persistent; fruit not seen.

Upper montane zone, above 6000 ft. Hakgala; Pedurutalagala; Horton Plains. Fl. Sept.

Mountains of India, and in China, Japan, Mauritius, Australia.

Often on *Symplocos*, *Eurya*, and other shrubs or small trees.

3. **NOTOTHIXOS,** *Oliv.*

Dichotomously branched shrub, parasitic on branches of trees, young parts woolly, l. opp., tomentose beneath, fl. very small, unisexual, monœcious, in terminal spikes; cal.-tube adnate to ov., limb absent; pet. (perianth-leaves) 4, persistent; anth. 4, sessile at base of pet. but not adnate to them, many-celled, opening by pores.—Sp. 5; 1 in *Fl. B. Ind.*

The other species of the genus are Australian.

N. floccosus, *Oliv. in Journ. Linn. Soc.* vii. 104 (1864). [PLATE LXXX.]

Viscum floccosum, Thw. Enum. 418. C. P. 3654.

Fl. B. Ind. v. 227.

Branches slender, cylindrical, young parts densely covered with pale pinkish-brown wool; l. small, $\frac{3}{4}$–$1\frac{1}{4}$ in., oval or ovate-oval or rotundate, acute or rounded at base, obtuse at apex, glabrous and bullate above, finely and densely woolly beneath, rather fleshy, petiole short; fl. sessile, few, in whorls on very short woolly spikes; pet. acute, spreading; cal.-tube densely woolly; fruit $\frac{1}{3}$ in., ovoid, capped with persistent pet., smooth, pale yellow or white.

Moist low country below 1500 ft., rather rare. Near Ratnapura; Kukul Korale; Reigam Korale; Hiniduma abundant; Palewatu, &c., Pasdun Korale. Fl. April, Sept.; greenish-white.

Endemic.

Viscum tomentosum, Moon Cat. 68, from Kalutara, is probably this.

4. **GINALLOA,** *Korth.*

Slender shrub, parasitic on branches of trees, stem jointed, l. opp., glabrous, fl. few, minute, unisexual, in very lax terminal spikes; cal.-tube adnate to ov., limb absent; pet. (perianth-l.) 3, persistent; stam. not adnate to pet., 2-celled.—Sp. 4; 3 in *Fl. B. Ind.*

G. spathulifolia, *Oliv. in Journ. Linn. Soc.* vii. 103 (1864).

Viscum spathulifolium, Thw. Enum. 136. C. P. 336.

Fl. B. Ind. v. 228.

Branches elongated, very slender, cylindrical (striate when dried), glabrous, joints long, each with a sheath-like scale; l. 1–3 in., linear, usual more or less spathulate, much tapering to base, rounded at apex, obscurely 3-nerved; fl. sessile, in distant opp. pairs in very slender opp. glabrous spikes, pet. rather large, oval, acute; fruit (? ripe) oblong-ovoid, about ⅓ in., topped with persistent pet., red (?).

Moist region extending into montane zone, very rare. Adam's Peak (Gardner, Thwaites); between Hanwella and Labugama (Ferguson). Endemic.

CXVIII.—SANTALACEÆ.

SHRUBS or trees, l. alt., entire, without stip., fl. small, polygamous, axillary, regular; per.-tube adnate to ov., segm. 3 or 5, each with a tuft of hair on upper surface, valvate; stam. 3 or 5, opp. per.-segm.; ov. inferior, sunk in per.-tube, 1-celled, ovules 2 or 3 on a central free placenta; fruit indehiscent, seed solitary, embryo in axis of copious fleshy endosperm.

Fl. 3-merous, in clusters or solitary . 1. OSYRIS.
Fl. 5-merous, in dense spikes . . 2. SCLEROPYRUM.

1. OSYRIS, *L.*

A shrub, l. alt., numerous, fl. small, polygamous (male and bisexual), axillary, male in clusters, bisexual solitary; per.-tube short in male, long solid and adnate to ov. in bisexual fl., segm. 3, valvate; stam. 3, inserted at base of per.-segm.; ov. inferior and sunk in solid perianth tube, placenta central, style short, stigmas 3; fruit indehiscent, seed solitary, embryo central in copious endosperm.—Sp. 5 or 6; 1 in *Fl. B. Ind.*

O. arborea, *Wall. Cat.* n. 4035 (1828).
Thw. Enum. 251. C. P. 53.
Fl. B. Ind. v. 232. Wight, Ic. t. 1853 (*O. Wightiana*).

A shrub, branches numerous, stiff, virgate, young ones angular, glabrous, l. rather crowded, ¾–1½ in., lanceolate, acute at base, obtuse but sharply apiculate, entire, glabrous, pale green, petiole very short; male fl. on short ped., bisexual ones

with a pair of acute bracts at base; per.-segm. broad, acute, with a small tuft of hair on upper surface, fil. very short; fruit $\frac{1}{4}$ in., ovoid, truncate, yellowish-white.

Lower montane zone, 3–5000 ft., on patanas. Confined to the Province of Uva, where it is abundant. Fl. April and August; pale green.

Also on the mountains of India.

Turns black when dry.

[*Santalum album*, L., the Sandal-wood, is given in Moon Cat. 11 as if a native; the locality, 'Kandy.' It is C. P. 2915, but these specimens are not localised. The tree is a native of Central Peninsular India, and known in Ceylon as a cultivated tree only; it was introduced (or re-introduced) here in 1850.]

2. SCLEROPYRUM, *Arn.*

A tree with axillary spines, l. alt., fl. small, polygamous, crowded in short axillary spikes; perianth-tube in male fl. solid, in bisexual fl. adnate to ov., segm. 5; stam. 5, opp. segm., fil. bifid, the anth.-cells on separate stalks; ov. inferior, immersed in per.-tube, placenta free, central, style short; fruit large, pyriform-ovoid, indehiscent; seed solitary, globose, embryo in axis of copious endosperm.—Sp. 2; both in *Fl. B. Ind.*

S. Wallichianum, *Arn. in Mag. Zool. & Bot.* ii. 550 (1858).
Pyrularia zeylanica, A. DC. in DC. Prod. xiv. 629. *P. Wallichiana*, A. DC., Thw. Enum. 251. C. P. 2555.
Fl. B. Ind. v. 234. Wight, Ic. t. 241. Bedd. Fl. Sylv. t. 304.

A small tree, bark smooth, greyish-white, branchlets stout, cylindrical, rather zigzag, armed with short sharp spines in the axils; l. 3–6 in., oblong-oval, acute or rounded at base, obtuse or subacute, glabrous, coriaceous, 3-nerved at base, brilliant red when young, petiole very short, stout; fl. nearly sessile, spike stout, catkin-like, densely pubescent, often several from axil, bracts filiform, deciduous; perianth pubescent outside, segm. ovate, acute, with a tuft of hair in centre; fruit $1\frac{1}{4}$ in., tapering to stout stalk below and capped with per.-segm., smooth, bright brick-red.

Moist region, chiefly in montane zone, 4000–6000 ft., very rarely lower; rather rare. Gongalla; Maturata; Hakgala; Avisawella (Jowitt); Hantane. Fl. Nov.–March; salmon-pink.

Also in S. India.

CXIX.—BALANOPHORACEÆ.

FLESHY root-parasites without leaves or chlorophyll, with hard worted rhizomes, through the rind of which the flowering stems burst irregularly, fl. unisexual, monœcious or diœcious, crowded in large heads, the male and fem. very dissimilar; male fl. conspicuous, perianth with 3–5 valvate segm., stam. 3–5, connate into a column; fem. fl. minute, without a perianth and consisting simply of a 1-celled hyaline ov. with 1 ovule and a long style, very numerous and crowded and intermixed with clavate bodies (spadicels); fruit minute, 1-seeded, embryo consisting of 2 or 3 cells only, in endosperm.

A very remarkable small Tropical family, simulating the larger fungi in habit.

BALANOPHORA, *Forst.*

For character, see Order.—Sp. about 12; 5 in *Fl. B. Ind.*

Monœcious; fem. head globose; bracts of male fl. shorter than ped. . . . . 1. B. INDICA.
Diœcious; fem. head pear-shaped; bracts of male fl. as long as, or longer than, ped. . . . . . 2. B. THWAITESII.

1. **B. indica,** *Wall. Cat. n.* 7247 (1828).
Langsdorffia indica, W. & A. in Hook. Ic. Pl. iii. t. 205. Thw. Enum. 293. C. P. 200.
Fl. B. Ind. v. 237. Hook. Ic. Pl. tt. 205, 206.

Rhizome tuberous with rounded lobes or branches, finely worted all over and with large scattered stellate pustules, pale brown; flowering stems numerous, crowded, male and fem. from same rhizome, 3–6 in., the male rather the taller, closely covered with few large, oblong-oval, obtuse, imbricated, glabrous, dull orange leaf-scales; male heads 2–2½ in., oblong-ovoid, fl. numerous, crowded, on rather stout ped., at first erect, afterwards drooping, bracts much shorter than ped., truncate, per.-segm. 4 or 5, linear, subacute, ⅙ in., reflexed, head of stam. blunt, white, exserted; fem. heads nearly globose, 1–1¼ in. diam., densely covered with the minute fl. and spadicels, ov. stalked, inserted both on the receptacle and the bases of the spadicels.

Forests of montane zone, 3000–6000 ft.; common. Fl. Oct.–March; male heads dull red, female purple.

Also in the Nilgiri Mountains, S. India.

Dries dark brown. I have had 'Jatamansi' given me as the S. name for this.

2. **B. Thwaitesii,** *Eichl. in DC. Prod.* xvii. 146 (1873). [PLATE LXXXI.]

Trim. Syst. Cat. Ceyl. 77; and in Journ. Linn. Soc. xxii. 330. C. P. 200 (part).

Fl. B. Ind. v. 238, 862.

Very like *B. indica* but differs in the following respects:— Rhizome larger and more branched, pustules more numerous and very large; flowering stems taller, 6–12 in., fewer, male and fem. apparently on separate rhizomes, leaf-scales larger, decurrent; male head much larger, $2\frac{1}{2}$–$4\frac{1}{2}$ in., somewhat stalked, bracts conspicuous, as long as or longer than ped., thick and fleshy, strongly ribbed above and channelled beneath so that the ends are crenate, fl. larger not very crowded, per.-segm. over $\frac{3}{8}$ in.; fem. head clavate-ovoid, 3 in. long, shortly stalked, ov. shortly stalked, inserted nearly always on receptacle very rarely on bases of spadicels.

Forests in the montane zone, above 4000 ft., rare. Raxawa, Dolosbagie (Thwaites); Nuwara Eliya; Hantane. Fl. Nov.–Jan.; male heads lemon-yellow, female purplish-brown.

Endemic.

Eichler's original description was made from a drawing of the male plant in the Kew Herbarium (being a copy of the original in Peradeniya Herb. here reproduced). When writing my note in Journ. Linn. Soc. I was inclined to regard this plant as merely a large variety of *B. indica* (as did Thwaites), but further examination of numerous specimens of both sexes has induced me, though with some doubt, to let it keep its specific rank. The whole plant is full of a waxy juice, and has a strong mousy odour.

CORRECTIONS IN PART II.

Page 37, line 3, for '**geminiflora**' *read* **conferta.**
,, 38, line 17 from bottom, for 'in' *read* n.
,, 74, line 14, for 'Kodippayam' *read* Kodippararu.
,, 89, line 23 from bottom, for 'Fl. B. Ind.' *read* Roxb. B. Ind.
,, 113, after line 8, *insert* Sp. 10; 1 in Fl. B. Ind.
,, 129, line 1, after 'ped.' *read* peduncles.
,, 140, line 9 from bottom, after 'Nilgiris' *insert* and.
,, 160, line 20 for 'Hanpalanda' *read* Hampalanda.
,, 169, line 22 from bottom, after 'oval-spathulate' *insert* very thick.
,, ,, after line 22 from bottom, *insert* L. petiolate, oval, thin. . . . 42. **E. Mooniana.**
,, ,, line 16 from bottom, *delete* 'Peduncles over $\frac{1}{2}$ in.'
,, ,, line 15 from bottom, *delete* the whole.
,, 172, line 7 from bottom, after **E. Fergusonii,** *Trim.*, *add* [PLATE XXXVIII.]
,, 199, last line, for 'trees' *read* Nees.
,, 242, last line, for 'specimens' *read* species.
,, 276, line 20, for 'pericarps' *read* pericarp.
,, 280, after line 19, *insert* endemic.
,, 287, line 6, for 'tetranda' *read* tetrandra.
,, 315, line 9, for 'species' *read* specimens.
,, 316, line 9 from bottom, for '?' *read* non.
,, 356, line 7, for 'Fl.' *read* For.
,, 391, column 2, line 7 from bottom, *add* 216.
,, ,, column 3, after line 20, *insert* Kuma . . i. 305.

LONDON:
Printed by Strangeways and Sons,
Tower Street, Cambridge Circus, W.C.